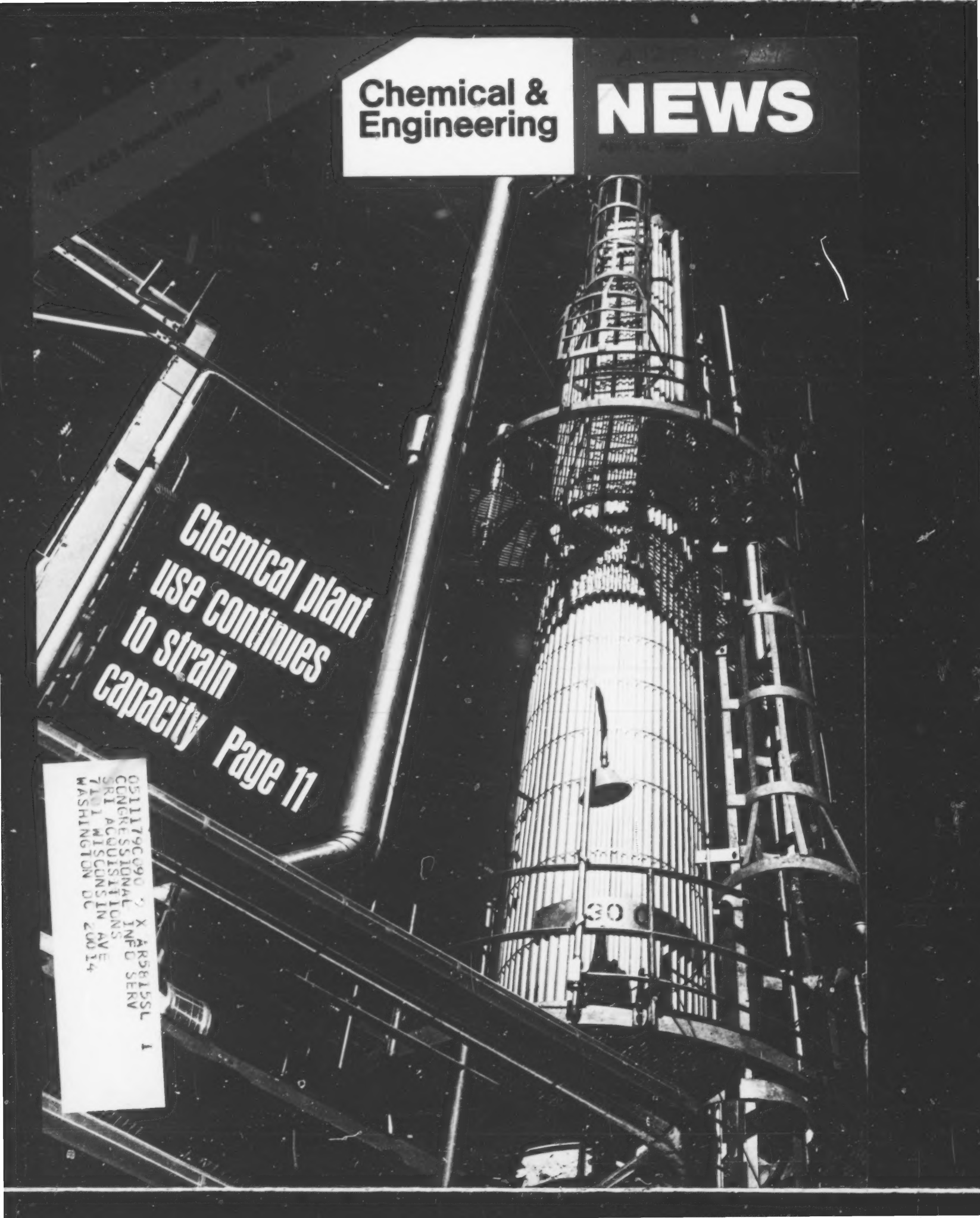
Chemical & Engineering NEWS



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CONGRESSIONAL INFO SERV
SRI ACQUISITIONS
7101 MISSONSIN AVE
WASHINGTON DC 20014

April 14, 1980
Volume 58, Number 15
CENEAR 58 (15) 1–84
ISSN 0009-2347

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Chemical capacity use up another notch

Despite signs of weakness in a number of products, overall capacity use at U.S. chemical plants rose to 81% by the end of last year

William F. Fallwell, C&EN New York; Bruce F. Greek, C&EN Houston

After holding level in the first half of 1979, capacity use at U.S. plants for basic chemicals swung up again in the second half.

By the end of the year, tight supply-demand for a dozen or so building-block products drove overall industry use of capacity to 81% of the nameplate (official) total and 88% of the effective maximum, C&EN finds in its latest semiannual survey.

However, as the industry averages moved up, a number of important products settled back. This suggests that overall capacity use cannot climb much higher.

In some cases, declines in capacity use were partly the result of new plants coming on stream—in ethylene and other basic olefins and aromatics, for example, as well as in vinyl acetate, carbon black, titanium dioxide, and 1,1,1-trichloroethane.

In many products, though, declines also may reflect softening markets. That could be true for propylene, for example, since polypropylene capacity use dropped noticeably by the end of 1979.

Benzene and *p*-xylene, too, may be tipping off slightly less robust business in their plant use declines. Excess production this winter in gasoline, a competitive outlet for these aromatics, may set the stage for further weakness.

In a separate measure of capacity use in leading polymers, C&EN finds overall averages little changed during 1979. Use of nameplate capacity stayed at 83%, slightly higher than in basic chemicals. Use of effective capacity edged up to a very respectable 90%.

In polymers, too, there were cross-currents. Among the big thermoplastics, capacity use still moved up from the beginning of 1979 for low-density polyethylene, high-density polyethylene, and polystyrene. However, use stayed flat for polyvinyl chloride and sank for polypropylene.

Synthetic fibers show a similar pattern. Although capacity use rose by the end of 1979 in polypropylene (olefin) filament and acrylic staple, it declined considerably in hard-hit polyester filament and in nylon staple.

At the high end of the capacity use spectrum, seven basic chemicals and three polymers sport effective capacity use higher than 95%. That's up from only three basic chemicals at the start of 1979 and unchanged from three polymers.

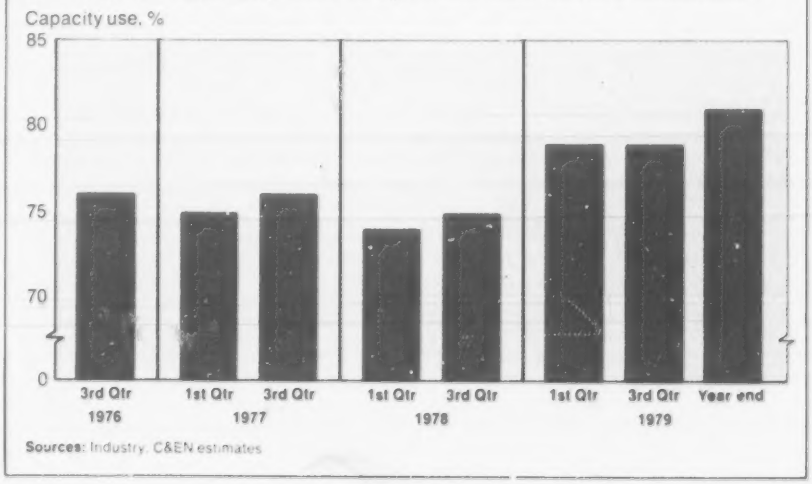
These ultrahigh figures touch some of the best chemical businesses—urea, methanol, soda ash, phosphoric

Polymers' nameplate capacity use stays high at 83%

Billions of lb	Year-end 1979 Capacity (nameplate)	Year-end 1979 Capacity use Nameplate	Year-end 1979 Capacity use Effective	First-quarter 1979 Capacity (nameplate)	First-quarter 1979 Capacity use Nameplate	First-quarter 1979 Capacity use Effective
Plastics						
Polyethylene, low-density	8.7	90%	97%	8.4	82%	88%
Polyvinyl chloride	7.5	79	92	7.0	79	92
Polyethylene, high-density	5.8	87	92	5.5	75	79
Polystyrene	5.3	83	92	5.2	71	8
Polypropylene	5.5	64	71	4.8	73	8
Synthetic fibers						
Filament yarn						
Polyester	2.1	73	78	2.1	86	91
Nylon	2.0	88	94	2.0	90	96
Olefin	0.92	73	78	0.92	72	77
Staple						
Polyester	2.7	92	98	2.6	93	99
Nylon	1.0	88	94	1.0	98	104
Acrylic	0.84	93	99	0.87	89	95
AVERAGE		**83%**	**90%**		**83%**	**89%**

Sources: Industry sources, Textile Economics Bureau, Society of the Plastics Industry, C&EN estimates

Nameplate capacity use is up from mid-1970's doldrums



Sources: Industry, C&EN estimates

Effective capacity use reaches 88%

Billions of lb per year unless otherwise noted[a]	Year-end 1979 Capacity (nameplate)	Year-end 1979 Capacity use Nameplate	Year-end 1979 Capacity use Effective	First-quarter 1979 Capacity (nameplate)	First-quarter 1979 Capacity use Nameplate	First-quarter 1979 Capacity use Effective
Oil-based petrochemicals						
Ethylene	38.5	82%	91%	35.2	85%	95%
Propylene (chemical)	22.5	61	68	20.0	72	80
Butadiene[b]	4.7	77	86	4.3	78	87
Benzene (bg)	2.6	66	72	2.3	70	76
***p*-Xylene**	5.3	75	83	4.3	84	92
Natural gas-based petrochemicals						
Ammonia (mt)	24.0	89	94	20.4	74	78
Urea (mt)	7.7	86	96	7.5	80	89
Methanol (bg)	1.35	97	108	1.35	78	87
Formaldehyde (37% solution)	8.5	75	79	8.5	78	82
Chlor-alkalies						
Chlorine (mt)	14.4	90	95	14.3	83	87
Caustic soda (mt)	15.5	90	95	15.2	76	80
Soda ash (mt)	9.7	93	98	9.7	82	86
Acids						
Sulfuric (mt)	57.5	83	87	56.0	75	79
Phosphoric (P_2O_5, mt)	11.0	100	105	10.7	95	100
Industrial gases						
Oxygen, **Nitrogen** (total, liquid, ttd)	32.4	68	86	30.7	67	86
Carbon dioxide (ttd)	14.1	69	79	12.5	65	77
Mineral-based inorganics						
Sulfur (mlt)	14.3	79	—	13.8	72	—
Potash (mt)	2.9	83	—	2.9	79	—
Phosphorus (tt)	550	90	95	550	83	87
Plastics monomers						
Styrene	9.3	94	99	8.2	88	93
Vinyl chloride	8.7	83	92	8.5	90	99
Propylene oxide	3.0	80	89	3.0	85	94
Fiber monomers						
DMT/PTA[c]	7.3	77	86	7.3	68	77
Ethylene oxide	6.6	90	100	5.8	79	88
Cyclohexane	3.2	75	79	3.2	76	80
Adhesives and coatings monomers						
Phenol	3.5	86	96	3.5	80	88
Vinyl acetate	2.5	80	84	2.2	82	86
Pigments						
Carbon black	4.3	74	82	4.0	91	99
Titanium dioxide (mt)	1.04	70	78	0.885	82	91
Solvents						
Ethanol (mg)	270	79	83	270	72	76
1,1,1-Trichloroethane	1.3	57	63	0.99	71	79
AVERAGE		**81%**	**88%**		**79%**	**86%**

a bg = billions of gal, mt = millions of tons, tt = thousands of tons, ttd = thousands of tons per day, mlt = millions of long tons, mg = millions of gal. b Based on extraction capacity of steam-cracking plants and dehydrogenation capacity only of dehydrogenation producers; could be more if extraction capacity of dehydrogenation plants were included. c Dimethyl terephthalate plus purified terephthalic acid, not including acid converted to DMT. **Sources:** Industry and government sources, C&EN estimates

C&EN's capacity use indicator—the ground rules

Capacity use at chemical plants is difficult to measure and requires certain assumptions to bring some order to the maze of variables affecting this critical indicator of the industry's health.

With the help of industry and government sources, C&EN measures capacity use as a percentage of both nameplate and effective maximums. Nameplate capacity is the official design capacity of plants at nonstop use all year. Effective capacity is the practical maximum capacity after reductions for regular maintenance shutdowns and changes in product mix. Effective capacity runs from 85 to 95% of nameplate for most chemicals.

Capacity use is given semiannually over a calendar quarter with no seasonal adjustment. The figures include plants actually running. Figures exclude new plants just starting up and old plants knocked out for long periods by accidents or mothballing. As much as possible, capacity figures stay current with expansions and debottlenecking.

Capacity figures do not take into account temporary fluctuations for fuel and electric power interruptions, equipment failure, and feedstock scarcity or substitution. The feedstock variables have been especially important in 1979, further reducing maximum output for a number of important products.

Products in C&EN's capacity use survey are the same as those in the Key Chemicals and Key Polymers series. Those are the core products of the industry, the basis for downstream production of thousands of more specialized products.

acid, styrene, ethylene oxide, low-density polyethylene, and polyester staple. In some of these products, high capacity use has flushed out a lot of new investment—methanol, soda ash, ethylene oxide, and low-density polyethylene. In the rest, producers are still cautious after generally overexpanding in the mid-1970's.

Capacity use in some other chemicals is tighter than shown by the arithmetic. One reason is feedstock scarcity or substitution. Unusual feedstock factors were important in 1979—though less so by the end of the year—for propylene, benzene, ammonia, urea, and carbon dioxide.

Propylene and benzene output for chemical use was held back by oil refiners' drive to divert some feedstock streams into gasoline. Ammonia, urea, and carbon dioxide were curbed for a while by lack of economical supplies of natural gas.

In ammonia and urea, feedstock factors resulted in considerable shutdown of capacity during much of 1979. But by year's end, data strongly suggest that a lot of sidelined capacity came back on stream. For this reason, C&EN now lists full ammonia capacity of about 24 million tons, even though some of this total is undoubtedly still out of operation.

Feedstock substitution also cut into 1979 production of ethylene coproducts, including propylene, benzene, and butadiene, from heavy liquids-based crackers. Feedstock factors may be less important in 1980 if market weakness spreads in a recession. A forerunner could be butadiene, whose problems in the rubber market outweigh production limitations from feedstock substitution. As a result, it is likely that butadiene plant capacity is less than the 4.7 billion lb listed by C&EN, since some older plants are probably being shut down. □

Mexican rubber industry plans big growth

Producers set goals to reduce imports of synthetics and cut natural's share of market; they need to raise capacity, diversify into other rubbers

Earl V. Anderson
C&EN, New York

Mexico's synthetic rubber producers have set two major objectives for themselves. One, like most other segments of Mexico's chemical industry, is to reduce the country's dependence on imported elastomers. The other is to lower natural rubber's share of the total Mexican elastomer market.

If projections bandied about by the Mexican rubber community prove to be accurate, the country's synthetic rubber companies figure to make advances toward both goals. But it will be a gradual process.

With the exception of 1974, when synthetic elastomer imports surged to 31%, imports have accounted for 15 to 21% of the Mexican synthetic rubber market. For the past two years, imports have hovered around 20% of synthetic rubber consumption. This year, imports may be shaved to around 17 to 18%.

The big problem facing Mexico's synthetic rubber industry is that it produces only three types of synthetic elastomers—styrene-butadiene rubber (SBR), polybutadiene, and nitrile.

The industry produces no butyl rubber, no polyisoprene, no ethylene-propylene polymers, and no neoprene. These elastomers, along with a scattering of other specialty products, account for 75% or more of Mexico's total imports of synthetics. And until one of Mexico's synthetic rubber producers adds some of these elastomers to its product line, Mexico still will be more dependent on synthetic imports than it wants to be.

By 1987, for instance, when Mexico's total synthetic rubber demand is projected to reach 243,000 metric tons—more than double what it will be this year—demand for synthetics that the country doesn't produce today is projected to reach 33,300 tons. Even if Mexico completely eliminates imports of synthetic elastomers that it already produces, those that it still doesn't produce will account for almost 14% of the country's demand in 1987.

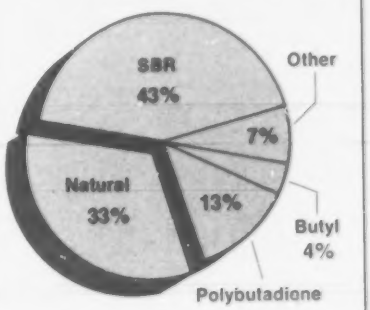
For a country that is bursting at the seams with hydrocarbon raw materials, such heavy dependence on imported synthetic elastomers may be unacceptable seven years down the road. Right now, however, there are no specific projects for butyl, polyisoprene, ethylene-propylene elastomers, or nitrile rubber on producers' drawing boards. And only one company admits—vaguely—that it is considering production of one or more of these elastomers.

Mexico's synthetic rubber producers are, however, taking steps to meet the country's growing appetite for elastomers that they already produce. Hules Mexicanos S.A. plans to increase its SBR capacity 77% over the next three or four years. The company, which is 60% owned by Mexico's national oil company, Petroleos Mexicanos, and 40% owned by Canada's Polysar, operates a 52,000 metric-ton-per-year SBR plant at Tampico. But Hules Mexicanos will be adding a 10,000 metric-ton-per-year line there that is expected on stream by this July. Another 10,000-metric-ton expansion will be ready by the first quarter of 1981. And Hules Mexicanos says that it will be putting in an additional 20,000 metric tons of SBR capacity by 1983 or 1984.

Negromex S.A., Mexico's other major synthetic rubber producer, also is on an expansion binge. It has a 45,000 metric-ton-per-year solution polymerization plant that can produce either SBR or polybutadiene at Salamanca. A company spokesman says that, right now, the plant is geared to produce 18,000 metric tons of SBR and 27,000 metric tons of polybutadiene.

Negromex, of which Phillips owns 40% and the remainder is owned by Mexican interests, is adding 10,000 metric tons of capacity at Salamanca. The addition is scheduled to be on stream during the second half of 1981.

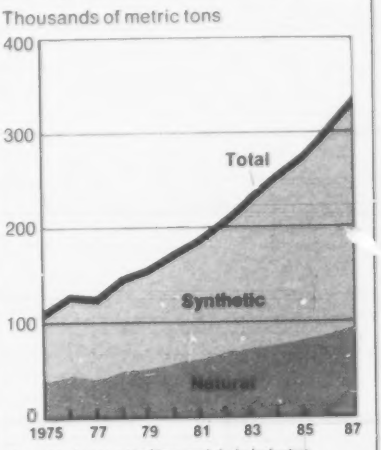
Natural rubber makes up a third of Mexico's rubber use



If these expansions come on stream as planned, Mexico's SBR capacity will increase 71%—from 70,000 metric tons to 120,000 metric tons. This assumes, of course, that Negromex splits its new capacity at Salamanca between SBR and polybutadiene as it does now with its existing capacity. Using the same assumption, the country's polybutadiene capacity will jump 56%, from 27,000 metric tons currently to 42,000 metric tons by late next year.

With these expansions, Hules Mexicanos and Negromex likely can handle Mexico's SBR requirements through 1985, when demand is ex-

Mexican rubber use to rise sharply during 1980's



Sources: Asociacion Nacional de la Industria Quimica, industry data

Natural rubber use will lose ground to synthetics in Mexico

Thousands of metric tons	1979	1980	1981	1982	1983	1984	1985	1986	1987
ELASTOMERS NOW PRODUCED IN MEXICO									
SBR	62.4	68.4	75.2	82.0	91.6	100.1	110.1	121.6	134.2
SBR latex	5.6	6.2	7.0	7.7	8.4	9.5	10.6	11.8	13.2
Polybutadiene	19.2	22.0	25.6	29.6	33.7	39.2	45.0	51.4	58.8
Nitrile	1.2	1.4	1.6	1.8	2.0	2.3	2.8	3.1	3.5
Total	88.4	98.0	109.4	121.1	135.7	151.1	168.5	187.9	209.7
ELASTOMERS NOT NOW PRODUCED IN MEXICO (IMPORTS)									
Butyl	6.6	7.1	7.7	8.5	9.2	10.4	11.0	11.9	13.1
Polyisoprene	1.8	2.0	2.2	2.3	2.5	2.8	3.0	3.3	3.6
Ethylene-propylene	1.6	1.9	2.2	2.4	2.8	3.3	3.8	4.7	5.4
Neoprene	3.7	4.2	4.5	5.0	5.5	6.2	6.7	7.3	8.0
Other	3.3	3.8	4.0	4.7	4.3	4.2	4.0	3.9	3.2
Total	17.0	19.0	20.6	22.9	24.3	26.9	26.5	31.1	33.3
Total synthetic rubber use	105.4	117.0	130.0	144.0	160.0	178.0	197.0	219.0	243.0
Natural rubber use[a]	49.6	55.0	59.0	65.0	70.0	75.0	81.0	86.0	92.0
Total rubber use	155.0	172.0	189.0	209.0	230.0	253.0	278.0	305.0	335.0
% Natural of total	32.3%	32.0%	31.2%	31.1%	30.4%	29.6%	29.1%	28.2%	27.5%

a Including latex. **Source:** industry sources

pected to reach 110,000 metric tons. By then, the country's two SBR producers undoubtedly will be considering even more SBR capacity.

Mexican SBR consumption, which grew at about 8% per year throughout the seventies, is expected to increase at or near that rate for at least the next seven years. If it does, demand in 1987 will reach 132,000 metric tons. And more capacity obviously will be needed if Mexico doesn't want to revert back to imports.

Mexican imports of SBR have fluctuated between a high of 9266 metric tons and a low of 789 metric tons since 1974. This year, SBR imports probably will decline as a result of the new capacity that Hules Mexicanos soon will start up. After next year, imported SBR will all but disappear in Mexico, with the exception of some specialty grades.

Negromex, if not some future new producer, will have to add more polybutadiene capacity even before 1985. Negromex's 42,000 metric tons of polybutadiene capacity will enable it to meet Mexican demand through 1984. Consumption that year probably will hit 39,200 metric tons, up 78% over the 22,000 metric tons that Mexico will need this year. In 1985, estimated consumption of 45,000 metric tons will exceed Negromex' capacity.

Despite ample capacity in Mexico, imports of polybutadiene amounted to 9.1% of demand in 1978 and an estimated 5.2% last year. This year, however, imports' share of the Mexican polybutadiene market are expected to drop to about 3.6%.

In addition to SBR and polybutadiene, Mexico also produces nitrile rubber and SBR latex. Hules Mexicanos is the country's sole nitrile producer, with a capacity at Tampico of 1500 metric tons annually. The company has no expansion plans in the works, even though Mexican nitrile demand has been estimated to be 1400 metric tons this year and 1600 metric tons next year. Nitrile imports have been relatively small, amounting to only a few per cent of Mexican demand. But if new nitrile capacity isn't started soon, imports will have to increase to meet demand.

Mexico's nitrile consumption is projected to grow at an average 12% annual rate over the next seven years, which will make nitrile one of Mexico's fastest-growing elastomers. Only polybutadiene and ethylene-propylene polymers will sport faster growth rates in the eighties.

Mexico's SBR latex capacity will start being squeezed by 1983. Two companies—Hules Mexicanos and Industrias Resistol S.A.—have a combined SBR latex capacity of about 8500 metric tons. Industrias Resistol, wholly owned by Mexican investors, operates a plant at Lerma, near Mexico City.

Demand for SBR latex in Mexico grew at an average annual rate of 12.8% during the 1970's. And even though this growth rate will ease off to about 11% annually in the eighties, consumption likely will increase from 6200 metric tons this year to 13,200 metric tons in 1987.

All in all, a 66% increase in synthetic rubber capacity in three or four years is no small accomplishment. But clearly, Mexico's synthetic rubber industry will have to develop more ambitious plans if it is to keep pace with internal demand, decrease imports, and, as it also hopes, increase exports.

The styrene and polybutadiene expansions already under way or planned will help for a few years. But more still will be needed for these two elastomers, for nitrile and SBR latex, and for the other major elastomers that Mexico has yet to tackle. An official of one Mexican synthetic rubber producer speaks of eventually exporting surplus material, especially to other Latin American countries. It is true that Mexico already does export some synthetic elastomers but volumes are small—only 1800 metric tons in 1978, 2100 metric tons last year, and an estimated 2500 metric tons this year. Of these exports, 70 to 80% is SBR.

What is painfully apparent is that Mexico will have no surplus elastomers to export unless it adds new capacity. There seems little doubt that it will come, though it may take a few years.

When and if Mexico's synthetic rubber producers do add new capacity, they will have no problems with raw materials. Pemex has several ambitious petrochemical expansion projects under way or planned that include feedstock for synthetic rubber. Butadiene capacity, for instance, will be expanded from 55,000 metric tons to 155,000 metric tons. Styrene capacity will jump from 33,000 metric tons to 183,000 metric tons. And Pemex plans to add 100,000 metric tons to the 74,000 of acrylonitrile capacity it already has. □

1979

American Chemical Society

ANNUAL REPORT

William J. Bailey

BOARD CHAIRMAN'S MESSAGE

The national charter of the American Chemical Society, which was enacted by Congress and signed by Franklin D. Roosevelt in 1937, sets three main goals for the society—"fostering public welfare and education, aiding the development of our country's industries, and adding to the material prosperity and happiness of our people." In 1979, for the first time, the society adopted a restatement of its long-term goals and set specific 1980 objectives toward accomplishing those goals.

Major functions of ACS fall under four main headings: Promote the extension and transmission of chemical knowledge; foster the use of chemical knowledge to advance the public welfare; enhance the education, productivity, and professional well-being of the individual chemist or chemical engineer; and strengthen the vitality of chemical institutions. Under these main headings, 13 subheadings and 31 specific objectives for 1980 were selected, a complete list of which was published in C&EN, Feb. 11, 1980, page 36. ACS always has been outstanding in the fields of exchange of scientific information and chemical education, but adoption of these new statements of our goals commits us to a better balance of our traditional activities with those in member and professional relations, public affairs, and public relations.

In the field of public affairs for 1979 the highlights include publication of the second edition of "Cleaning Our Environment—a Chemical Viewpoint," and establishment of an information referral service at ACS headquarters in the field of chemical health and safety. ACS issued a record number of public policy statements, 19, during the year. To implement one of the statements, "Industrial Innovations and Private Investment in R&D," a Task Force on Industrial/Academic Cooperation was established under the chairmanship of Norman Hackerman.

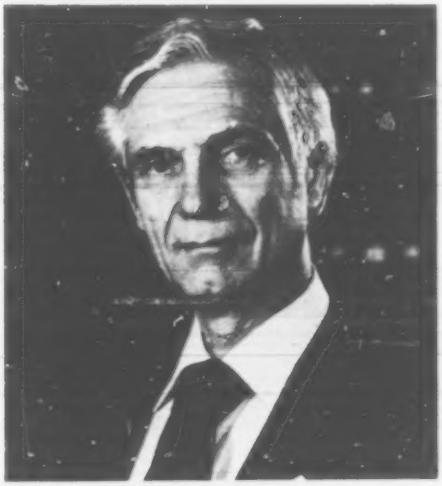
In the academic arena we launched our new publication, *SciQuest*, which is targeted for high school science students. We also published the third edition of "Safety in Academic Chemistry Laboratories." ACS approved a program whereby small colleges can purchase *Chemical Abstracts* with discounts up to $4500 and also receive free a number of *CA* services. *CA Selects* was expanded and has become a major product of ACS. Production rate of ACS Video Courses in Continuing Education was doubled, and a comprehensive offering of courses is now possible.

In the field of member services, we initiated group flights to national ACS meetings; we predicted that at least 500 members would utilize the service to the Houston meeting and at least 1000 would take advantage of the reduced fares to San Francisco. Since the savings average more than $150 per passenger, the total savings for members will be substantial. In addition, we hope to generate at least 40 free tickets that will be made available to local sections that help arrange the group flights. Cards entitling member discounts of up to 30% on car rentals for either personal or business purposes were sent to all members. Since ACS life insurance is one of the best bargains in the insurance field, often saving members several times their annual dues, the board approved offering one-year free life insurance to all new members as a recruitment incentive for an indefinite extended period. A search for other low-cost services to members is under way.

The board met with officers of the American Institute of Chemical Engineers in September to exchange views and explore possible areas of cooperation. The initial discussions were very fruitful and a number of joint projects are now under way.

In the international chemical area, 1979 was a banner year. It began with the joint meeting in Hawaii with the Chemical Society of Japan, in cooperation with the Chemical Institute of Canada, the Royal Chemical Institute of New Zealand, and the Royal Chemical Institute of Australia. It also included the 7th International Meeting of Chemical Society Presidents in Washington, D.C. The Agency for International Development funded two cooperative research projects that were recommended by a workshop in Egypt and a second workshop for 1980 in India was funded by the National Science Foundation.

WILLIAM J. BAILEY



Gardner W. Stacy

PRESIDENT'S MESSAGE

During my term as ACS president, I was involved in more than 50 different events. I lectured before or participated in local section meetings, regional meetings, divisional meetings, local section officers' conferences, and award banquets, or I presided over various meetings of the society. I had the privilege of addressing some very interesting non-ACS gatherings at various locations, which included the Engineering & Science Foundation of Dayton; a joint Phi Beta Kappa-Sigma Xi initiation luncheon at the University of Missouri, Columbia; the Dallas Society of Analytical Chemists, Air Products & Chemicals Inc., Allentown, Pa.; the Technical Community, Monsanto, St. Louis; and the R&D staff at Mobay Chemical Co. at both New Martinsville, W.Va., and at Pittsburgh.

Because of conflicts during my presidential term, I was unable to accept all the invitations to speak that were extended. However, some of these are being carried over to my 1980 term as immediate past-president.

Aside from communication with ACS members, my main attention was focused on the worldwide energy problem, more ef-

fective ACS service to industrial chemists, and international meetings. With the help of W. M. Tuddenham's subcommittee from the Committee on Membership Affairs, I staged the first Presidential Conference for Industrial Chemists in St. Louis. A major recommendation of that conference is that ACS seek out innovative and effective methods to communicate various ACS services and programs to its members. It is clear that ACS already has available much that members want, but that they do not realize exists. We should improve upon this situation as rapidly as possible. The full report including recommendations of the conference is now being prepared and will soon be available.

It is my hope that the Conference for Industrial Chemists will become a permanent forum for this sector of the society's membership, and indeed, one of the conference's recommendations is to continue scheduling conferences on a regular basis.

Aside from speaking widely on the energy challenge, I also selected this theme for the Second ACS Presidential Plenary Program, scheduled at the 178th ACS National Meeting in Washington, D.C. Melvin Calvin and John Deutsch were featured in this program on energy policy and research and attracted an audience of well over a thousand. The reception which followed, sponsored by the Chemical Society of Washington at the Corcoran Gallery of Art, also was an outstanding attraction.

International meetings were in the spotlight for ACS during 1979. ACS joined with the Chemical Society of Japan and the chemical societies of Australia, Canada, and New Zealand in Honolulu to produce a record program of papers. I felt fortunate to copreside with Yasuhide Yakawa, president of CSJ, over a unique joint Award Banquet with ACS. Another major event was a luncheon for a visiting delegation of chemists from the People's Republic of China.

Later in the year, following the Washington meeting; I was again very fortunate to be involved in a special international event, the 7th International Meeting of Chemical Society Presidents, as this event returned to the site of its inaugural meeting originated by former ACS president Charles G. Overberger. The topics that were discussed were: aid to developing countries, the role of chemistry and of chemical societies in the transfer of science and technology among nations, programs for the international exchange of chemists, formation of an international chemical society, chemical cooperation in establishing regional research centers in developing countries, upgrading chemical education and the practice of chemistry in developing countries, developments in the registration and licensing of chemists, relationships between universities and chemical industry, and chemistry's role in the provision of energy.

GARDNER W. STACY

FROM THE EXECUTIVE DIRECTOR

Achievement of an all-time high in membership, initiation of book sales to the People's Republic of China, and increasing emphasis on government relations were among the outstanding developments of 1979 for ACS.

The year-end member total of 118,214 was 1751 above the previous record, set in 1969. With resignations running below average, prospects for continuing growth in 1980 seemed excellent.

For me personally, the year's highlight unquestionably was my visit to the People's Republic of China last spring with a group of scientific and educational publishers. Subsequently, ACS received a substantial book order and a smaller order for ACS Audio Courses. We anticipate increased sales of books, journals, and other products to the Chinese.

On a second journey abroad, I visited Achema in Frankfurt last June and garnered several ideas for our own expositions. While there I conferred with James V. Seals, manager of international marketing for Chemical Abstracts Service, and leaders of numerous European scientific organizations.

ACS received a National Science Foundation grant to cosponsor with the Indian Chemical Society a 1980 workshop in India to prepare a list of projects on which scientists of both countries might collaborate. Meanwhile, the Agency for International Development funded two projects recommended at a similar workshop in Egypt in 1977.

The society has continued to make available to Congress and to federal agencies the expertise of its members, submitting a record 19 public policy communications to appropriate officials during 1979.

ACS gave the National Research Council $25,000 to help support a study of effective laboratory procedures for the safe handling and disposal of hazardous substances. We in turn received a $30,000 grant from the National Science Foundation to support a "Physically Handicapped in Science" project.

The society started cooperating with the National Cancer Institute in a study of the mortality experience of society members. We also continued to work with the Council on Postsecondary Accreditation (COPA) to develop new guidelines and criteria for evaluating accrediting groups. If accepted, the ACS system, which is simpler and less costly than COPA's, may be offered as a model for other discipline-oriented agencies.

Among other 1979 highlights were: the first meeting (at the ACS

Raymond P. Mariella

building in July) of all society segments concerned with marketing; appointment of a new auditing firm, Coopers & Lybrand, which offers a wider range of services than was previously available; and completion of arrangements for a car rental discount for all ACS members and for group plane fares to the Houston and San Francisco national meetings.

As with government officials, I have tried to establish and maintain good relations with chemical industry representatives, through the Chemical Manufacturers Association, and with leaders of other professional societies, through the Council of Engineering & Scientific Society Executives (in July I was elected to a three-year term on the CESSE board of directors). I also have continued my interest in academe. In October, I lectured on "Life as a Chemical Professional" at three Texas universities under the auspices of the Robert A. Welch Foundation. I stressed the many valuable services offered by ACS.

My saddest duty of the year was attendance at funeral services in the MIT Chapel for Henry Hill. At his son's request, I spoke briefly on Hill's many contributions to our science, our profession, and our society—which he served so well as president in 1977.

RAYMOND P. MARIELLA

MEMBERSHIP AFFAIRS

NEW MEMBERS

An all-time high in total ACS membership was recorded in 1979, surpassing the record set a decade earlier by some 1400. The total at the end of 1979 was 118,214, compared to 116,816 in 1969, the last year of $16 annual dues. Membership in 1978 was 116,240. Of the 8070 new members admitted in 1979, 38% were students, with full-dues members accounting for the balance. The Admissions Committee, appointed by the president from members of Washington, D.C., area sections, considered 9773 applications during the year (1097 were accepted for 1980 membership).

Emeritus status was granted 1324 retired members with at least 35 years of membership, bringing the total in this category to 6904 at year's end. Of these, 273 were recognized for having reached their 50th year as members. In addition, retired members paying dues at half the regular rate totaled 3115, bringing the grand total of retired to 10,019, or 8.5% of all ACS members.

The Admissions Committee also approved the advancement of 289 associate members to full membership and the enrollment of 71 national affiliates. Resignations effective Jan. 1, 1980, totaled 1392, down 235 from the previous year, and 4230 were dropped for nonpayment of dues, 72 fewer than in 1978.

Membership statistics

	Dec. 31 1978	Dec. 31 1979
Paid members and associate members		
No discount	92,826	93,934
Student discount	9,354	9,727
National service discount	7	9
15-year retired discount	3,537	3,115
Life members	2	2
Dues deferred—unemployment	342	312
Disabled	83	97
Emeritus status members	5,824	6,904
Total members in good standing	**111,975**	**114,100**
Unpaid members	4,265	4,114
TOTAL MEMBERSHIP	**116,240**	**118,214**

Membership admission data	Dec. 31 1978	Dec. 31 1979
Full rate	4978	5033
Student discount rate	2720	3037
National service rate	—	—
15-year retired rate	8	—
	7706	**8070**
New student members as % of total	**35.3%**	**37.6%**

Membership retention Year	Per cent
1972	94.1%
1973	94.1
1974	94.3
1975	95.1
1976	94.8
1977	94.7
1978	94.9
1979	95.2

Jan. 1, 1979	**110,311**
Dec. 31, 1979	**118,214**

Less:			
Resignations effective 1/1/80	(1627 last year)	1392	
Dropped effective 1/1/80	(4302 last year)	4230	
Total removed from rolls	**(5929 last year)**	**5622**	**(5,622)**
Net membership carry-over from 1979			112,592
Plus: New members effective Jan. 1, 1980			1,097
Jan. 1, 1980			**113,689**

EDUCATION

High school chemistry. In January 1979 the ACS Office of High School Chemistry was established to provide programs and services for high school chemistry teachers. During its first year the office produced two publications, "American Chemical Society Awards to High School Teachers" and "Programs for High Schools—A Local Section Activity Book." The office sponsored its first Expert Demonstrator Training Activity (EDTA) at the University of Wisconsin, Madison, for representatives from 12 local sections who will in turn conduct demonstration workshops for high school teachers in their communities. Following the donation of 34 films by Imperial Chemical Industries Americas, the office established a high school film library for free use by ACS teacher members.

Project SEED. As in past years, the Catalyst program continued to dominate Project SEED activities, with more than 127 disadvantaged high school students participating in summer research programs at 58 colleges through ACS funding. An additional 35 students were able to participate through contributions from local sources, including ACS local sections, chemical companies awarding grants to specific colleges, Neighborhood Youth Corps, and chemistry departments. Another facet of Project SEED enabled about $250,000 worth of journals and reference materials to be placed in colleges and universities serving the disadvantaged.

Student affiliates. Ten new student affiliate chapters were chartered in 1979, bringing the total to 729. Seventy-five hundred student affiliates were enrolled; of this number, 39% were women, an increase of 9% since 1974. Nineteen chapters received grants of $50 to $250 for innovative chapter projects; each chapter must match the amount of its grant through its own fund-raising efforts. The Student Affiliate Newsletter increased from 12 to 16 pages and from three issues to four per year. Program aids produced and sent to faculty advisers included a directory of speakers and tours, a catalog of films available to chapters through the Student Affiliate Film Library, and a cross-referenced listing of chapters and local sections. Ten thousand T-shirts and 20,000 bumper stickers were sold during the year.

Cooperative education. July 1979 marked the establishment and staffing of the ACS Cooperative Education Service to promote the use of practical, chemistry-related work experience as a complement to classroom learning and to coordinate ACS activities in this area. In addition to its direct educational benefits, cooperative education helps students make informed career choices, is a useful and inexpensive recruiting tool for employers, and increases the interaction between the academic and industrial components of the society. The service is unique in that it is designed to reach an entire profession—students and representatives of chemical employers and educational institutions—rather than serve a single organization or interest group.

Professional training. The number of ACS-approved departments increased by six in 1979 to a total of 553. Whereas the number of bachelor's degrees awarded by these departments continued to rise slightly, the number of master's degrees declined. The number of doctorates remained the same as in the previous year. The 1979 edition of the "Directory of Graduate Research," published biennially, was issued in October. Plans for converting the preparation of the fifth edition of "College Chemistry Faculties" to a computerized process were completed, with publication scheduled for fall 1980. Future editions are to be published on a biennial basis.

Career services. A series of articles entitled "Career Options in Chemistry" was introduced in 1979. The articles outline basic facts about a variety of career specialties open to chemists, and feature profiles of people in each field. Two articles were published in 1979, and the series will continue through spring 1982. Also added to the catalog of career publications was "Graduate Programs in Chemistry," a booklet that describes advanced degree programs and lists schools that offer these programs. Career Services distributed about 14,000 copies of 13 career guidance publications in response to requests for specific titles; in addition,

more than 3000 individuals, schools, public libraries, and teachers were sent packets of at least 10 publications in response to requests for career information.

Continuing education. ACS Short Courses continued to provide chemists and chemical engineers with the opportunity to learn from some of the nation's top scientists and educators. In 1979, 49 topics were presented for a total of 76 public sessions, the largest number offered in a single year since the program began. Total enrollment for the year was 3000. Since the program's inception in 1965, some 40,000 chemical scientists and engineers have attended

The ACS Audio Courses program grew markedly; course distribution increased 50% over the previous year, and nine new courses were released, bringing the catalog of titles to 52. Firm author commitments for 40 additional courses were in hand at year's end.

An audio/print unit based on the Einstein Symposium sponsored by the ACS Division of Chemical Education during the 1979 fall national meeting went into production and will be released in mid-1980. Part II of Polymer Science & Technology, an ACS Correspondence Interaction Course, was released.

"Young Chemists: In Transition," a film produced by the ACS Younger Chemists Committee, was added to the ACS Film/Video catalog. The video portion and the reference manual of the course on Chemical Engineering for Chemists were completed for release in early 1980. In addition, a new course, Thermal Methods of Analysis, and the second edition of Interpretation of Infrared Spectra were in production in 1979 and are scheduled for 1980 release.

Eight Project CEDS (Continuing Education Delivery Systems) courses were in preparation, with four using video techniques and four using computer systems, including PLATO. Through an agreement with Control Data Corp., several business-related PLATO courses were made available to ACS members at 50 locations throughout the country.

Education of the handicapped. ACS was awarded a National Science Foundation grant for a project entitled "The Physically Handicapped in Science." The project, which seeks to develop guidelines for teaching chemistry to handicapped students, will be completed in 1980.

LOCAL SECTIONS

Energy, safety, continuing education for members, and programs for high school chemistry students and teachers were the principal concerns of the society's 178 local sections in 1979. They also continued to emphasize popular presentations of scientific topics at their meetings, including alternate energy sources, chemical oceanography, forensic chemistry, color photography, cancer chemotherapy, and "art and alchemy." The sections increasingly sought to bring chemistry closer to the public through sponsorship of museum exhibits, technology shows, a science documentary for radio, public lectures, radio public service announcements, and the planetarium show "The Loneliness Factor."

Twenty-three Program Development Fund grants totaling nearly $13,000 were made to sections in 1979 to support innovative activities, including chemical safety workshops, lecture-demonstration programs, a videotape production, and a careers program for high school students.

Winners of the ACS Award for Outstanding Performance by Local Sections were, in the four size categories, Akron (large), Eastern New York (medium large), Central North Carolina (medium small), and Wilson Dam (small).

As of July 1, ACS members and national affiliates assigned to local sections totaled 106,554, an increase of some 1500 over 1978. The sections were represented by 364 councilors during the year. More than 30 sections participated in a program, new in 1978, wherein the ACS national office collects section dues.

The Local Sections Speaker Service arranged some 90 lecture tours for about 150 sections and subsections involving more than 370 lectures. The typical tour consisted of four section visits at a cost of about $155 per engagement, as compared with $140 in 1978.

Two sections—Georgia and Wichita—celebrated their 50th anniversaries during 1979, and three marked their 25th—Eastern North Carolina, Indiana-Kentucky Border, and Santa Clara Valley.

DIVISIONS

Membership in the society's divisions increased overall 2.4% in 1979, and all but eight of the 31 divisions showed individual increases. The largest rise was 224 or 8% for Industrial & Engineering Chemistry; the largest drop, 109 or 17% for Chemical Marketing & Economics.

Permanent status was granted the Division of Chemical Health & Safety at the fall meeting in Washington, bringing the total number of full-status divisions to 29. In addition, the Divisions of Geochemistry and Small Chemical Businesses continued in their probationary period. The ACS Board of Directors made available $175,000 for support of divisions in 1979; of this, $167,861 was distributed.

Samuel E. Horne Jr. of B. F. Goodrich in Brecksville, Ohio, was

ACS division members and affiliates (paid only) as of Dec. 31, 1979

Division	Members		Division affiliates		National affiliates	
	1978	1979	1978	1979	1978	1979
Agricultural & Food Chemistry	1,192	1,247	161	167	0	1
Analytical Chemistry	4,205	4,219	182	181	2	6
Biological Chemistry	2,917	2,887	10	9	2	2
Carbohydrate Chemistry	653	660	2	0	0	0
Cellulose, Paper & Textile	619	641	58	60	0	1
Chemical Education	2,702	2,643	233	207	2	3
Chemical Health & Safety	323	454	48	46	0	0
Chemical Information	841	848	114	109	7	6
Chemical Marketing & Economics	634	525	240	187	2	0
Colloid & Surface Chemistry	1,218	1,291	115	184	1	1
Computers in Chemistry	519	548	22	18	2	2
Environmental Chemistry	1,489	1,580	105	130	1	0
Fertilizer & Soil Chemistry	342	334	6	5	2	1
Fluorine Chemistry	356	360	25	29	0	0
Fuel Chemistry	824	874	7	14	0	0
Geochemistry (Prob.)	20	105	0	14	0	0
History of Chemistry	244	270	33	36	0	0
Industrial & Engineering Chemistry	2,798	3,022	0	4	1	5
Inorganic Chemistry	2,133	2,205	46	39	0	0
[illegible]anal Chemistry	2,911	2,946	438	422	1	0
Microbial & Biochemical Technology	632	686	161	188	1	1
Nuclear Chemistry & Technology	761	757	118	152	2	1
Organic Chemistry	4,597	4,715	1	2	1	0
Organic Coatings & Plastics Chemistry	2,695	2,660	243	202	4	4
Pesticide Chemistry	1,069	1,104	212	238	1	1
Petroleum Chemistry	1,685	1,714	126	140	2	3
Physical Chemistry	2,044	1,960	29	36	0	0
Polymer Chemistry	4,130	4,195	489	477	0	0
Professional Relations	525	516	0	0	0	0
Rubber Inc.	1,996	2,146	1894	1837	0	0
Small Chemical Businesses (Prob.)	7	113	0	12	0	0
TOTAL	47,081	48,228	5118	5145	34	38

named winner of the Rubber Division's 1980 Charles Goodyear Medal for his work with Ziegler catalysts in the polymerization of butadiene and isoprene. The announcement was made at the division's October meeting in Cleveland.

The annual Divisional Officers Conference was augmented by a special Long-Range Planning Workshop for Divisions, funded by the ACS Science Commission (experimental) and organized by the council Committee on Divisional Activities. The council Committee on Meetings & Expositions sponsored the Seventh Annual Program Coordination Conference.

EMPLOYMENT AIDS

An improvement in the job market during 1979 was indicated by statistics from the society's employment clearinghouses. Applications on file in the year-round clearinghouse in Washington declined; at 622 down 8% from 1978's 771. Clearinghouses at the two ACS national meetings in 1979 averaged a ratio of job seekers to employers of 1.6, down from 1.9 in 1978, with totals for the national meeting clearinghouses as follows:

	High year 1960	Low year 1971	1978	1979
Candidates	796	1048	775	698
Employers	1965	297	500	437
Interviews	12,689	1152	2821	2438
Interviews/candidates	16.0	1.1	3.6	3.5
Candidates/employers	0.4	3.5	1.6	1.6

For the first time, a National Employment Clearing House also was operated at a regional meeting —the 11th Central Regional Meeting at Columbus, Ohio. This accounted for an additional 83 candidates, 41 employers, and 200 interviews.

At the Washington clearinghouse, the files were searched 413 times (444 in 1978) and 3357 résumés (3128 in 1978) were mailed to employers. Employers requesting searches in 1979 were classified as follows: industrial 263, academic 36, government 11, others 103. Positions open, grouped by broad fields, ranged from a high of 63 for analytical chemistry to five for clinical chemistry. Organic was second highest with 59, followed by polymer with 49.

Employer use of "Academic Openings" increased for listings placed by universities—195 vs. 187 in 1978. Positions listed at 217 were up 9% from 187 in 1978. In July, both "Academic Openings" and "Newspaper Clipping Service" became subscriber items; both continued to gain new subscribers. There were 12 issues of the former in 1979.

The Employment Aids Office processed 546 free "situation wanted" ads placed in C&EN by unemployed members in 1979, up from 531 in 1978. Responses to the ads were forwarded to the members (9323 vs. 11,584 in 1978). An additional 2437 went to employers using box numbers (3447 in 1978). The Confidential Employment Listing remained steady, with 80 members and seven employers registered at year's end. The $300 yearly retainer plan that provides all employment services was purchased by 43 employers, up from 25 in 1978.

MEETINGS AND EXPOSITIONS

Records toppled at the ACS/Chemical Society of Japan Chemical Congress in April in Honolulu, where 4919 papers were given by 10,641 authors at 672 sessions—all new highs. Attendance, at 9375, also was high for a spring national meeting. Attendance for the year, including the fall national meeting in Washington, D.C., totaled 19,321, up sharply from 1978's 13,411 and close to the 19,664 recorded in the Centennial year of 1976. Registrations at the year's nine regional meetings totaled 6524, down from the record 7789 in 1978, probably the result of increased interest in the national meetings. An experiment that proved successful at the Midwest Regional Meeting was the presentation of all con-

ACS national meetings, 1978–79

	Registration	Papers	Divisions	Sessions	Authors
175th (1978) Anaheim, March 12–17					
Total[a]	6846	2148	24	344	4,275
One-day sessions	651				
Advance registrations	4324				
Unemployed	20				
176th (1978) Miami Beach, Sept. 10–15					
Total[a]	6565	2400	28	408	4,870
One-day sessions	469				
Advance registrations	5002				
Unemployed	30				
177th (1979) ACS-CSJ Chemical Congress Honolulu, Hawaii, April 1–6					
Total[a]	9375	4919	28	672	10,641
One-day sessions	99				
Advance registrations	8066				
Unemployed	109				
178th (1979) Washington, D.C., Sept. 9–14					
Total[a]	9946	3050	30	461	6,355
One-day sessions	1123				
Advance registrations	6580				
Unemployed	93				

a Includes one-day-session registrations.

1979 ACS regional meetings

Meeting and location	Dates	Number of half-day sessions	Number of papers	Attendance
13th Middle Atlantic West Long Branch, N.J.	March 20–23	65	322	1068[a]
11th Central Columbus, Ohio	May 7–9	38	262	955
13th Great Lakes Rockford, Ill.	June 4–6	46	361	637
34th Northwest Richland, Wash.	June 13–15	33	179	526
9th Northeastern Syracuse, N.Y.	Oct. 2–5	41	285	650
15th Western[b] Pasadena, Calif.	Oct. 10–12	39	243	760
31st Southeastern Roanoke, Va.	Oct. 24–26	48	383	828
15th Midwest St. Louis	Nov. 8–9	6 symposia 18 poster	22 195	608
35th Southwest Austin, Tex.	Dec. 5–7	33	253	492
TOTAL			**2505**	**6524**

a Plus 150 high school students. b Joint with the Southern California Section of the Society for Applied Spectroscopy.

tributed papers within poster sessions mounted inside the perimeter of an accompanying chemical exposition.

Every seven years, ACS hosts the annual Intersociety Energy Conversion Engineering Conference, which directly involves the ACS Divisions of Fuel and Petroleum Chemistry. In 1979, ACS made arrangements for some 1000 registrants and published a 2372-page proceedings. ACS staff members for the second time managed the annual U.S./U.S.S.R. Joint Symposium on Chemical Catalysis.

In its first full year of operation, the new Chemical Expositions Department sold some 275 booths: slightly more than 100 at the Honolulu congress and 174 at the Washington fall meeting. An airline strike coupled with the offshore location made for a disappointing turnout in Honolulu.

PROFESSIONAL RELATIONS AND MANPOWER STUDIES

ACS concern for the professional well-being of chemists and chemical engineers in 1979 was exemplified by actions taken by the Committee on Professional Relations (CPR) and coordinated through the Office of Professional Relations (OPR). One of these, a statement espousing enactment of severance pay legislation in the U.S., was developed and adopted by CPR on the basis of its study of severance pay practices in other countries. The statement, accompanied by the study report, was transmitted to the ACS Board of Directors in the fall and was scheduled for board committee review at year's end.

Also referred to the board was a recommendation that CPR administer the ACS Legal Aid Loan Program. CPR's Subcommittee on Member Assistance began revising the lending guidelines. The Subcommittee on Professional Standards in 1979 began development of an employer recognition program to promote the society's "Professional Employment Guidelines."

A statement prepared by CPR's Subcommittee on Hazards & Toxins, concerning problems of environmental hazards and toxins, carried in the Sept. 17, 1979, issue of C&EN, elicited many comments from members for CPR's consideration in recommending appropriate ACS action. CPR resumed providing local section publication editors with articles about developments in professional relations, and three were made available during the year.

Mutually beneficial contacts with appropriate government offices were strengthened by the Subcommittee on Civil Service Liaison in 1979. The special counsel of the Merit Systems Protection Board attended the subcommittee's September meeting and discussed the functions of that office in protecting whistleblowers in federal service. in December the subcommittee met with four high-level representatives of the U.S. Office of Personnel Management to discuss concerns pertaining to chemists and chemical engineers in the Civil Service.

OPR gathered information on 14 layoffs of chemists and chemical engineers reported in 1979, a decrease of two from 1978. A committee report on 13 layoffs involving 131 chemists and chemical engineers (for which information was gathered in 1978) appeared in the Jan. 22, 1979, issue of C&EN, and an article (prepared by C&EN staff members based on a CPR report) on six layoffs involving 60 chemists and chemical engineers appeared in the Nov. 26, 1979, issue.

OPR received 11 formal requests for member assistance in 1979—six more than in 1978. During the year, 12 member assistance cases were reviewed by CPR's Subcommittee on Member Assistance and three cases were closed.

Other activities of CPR and OPR included rewriting two professional relations publications—"Employment Agreements" and "Trade Secrets. . .Ethics and Law"—and supplying the Professional Orientation Seminar (materials to help prepare graduating chemists for industrial employment) to 15 chemistry departments or student affiliate chapters representing some 800 students. CPR cooperated with the ACS Division of Professional Relations in presenting two symposia and a professional relations caucus at ACS national meetings.

The society's Office of Manpower Studies (OMS) filled a request for information concerning compensation for employed inventors by adding several questions to its annual survey of the ACS membership. OMS also began a project to learn how academic chemists use computers in their research and what kinds of computers they use. In cooperation with the council Committee on Economic Status, OMS helped other committees, local sections, and ACS staff offices to conduct surveys and analyze results.

Early in 1979, OMS published the society's fifth annual statistical report on chemical manpower, "Professionals in Chemistry: 1978." Other projects included surveys to obtain information about salaries and employment, both of experienced chemists and of chemistry and chemical engineering graduates, and publication of the *OMS Bulletin*, which gives the results of special OMS studies on compensation of chemists and chemical engineers.

RESEARCH GRANTS & AWARDS

PETROLEUM RESEARCH FUND

ACS received more than $6.7 million from the Petroleum Research Fund Trust in 1979 "exclusively for advanced scientific education and fundamental research in the 'petroleum field,' which may include any field of pure science which . . . may afford a basis for subsequent research directly connected with the petroleum field." These funds permitted the commitment of $6,018,576 for new grants in the various programs in effect during the year (see accompanying table).

The ACS-PRF grants program continues to emphasize modest grants-in-aid to colleges and universities in support of faculty research with students and postdoctoral fellows. Flexibility in the use of funds to achieve the objectives of the research project is an important feature. Two programs, the ACS-PRF Type B program of grants for fundamental research in "undergraduate departments," and the Type G, "Starter" grant program for beginning faculty researchers, are intended to meet needs which are deemed especially critical. Because ACS-PRF grants are grants-in-aid in support of ongoing programs of research and education, grantee

Glenn T. Seaborg, Lawrence Berkeley Laboratory, accepts Priestley Medal from ACS president Gardner W. Stacy

institutions, such as universities, are willing to administer them without overhead or administrative charges. This mutually beneficial system enables PRF funds to assist more research than they would if the full cost of research had to be paid.

During 1979 the ACS Board of Directors voted, upon recommendation of the PRF Advisory Board, to discontinue ACS-PRF Grants for New Directions in Fundamental Research. The advisory board recommended that available funds be committed to the ACS-PRF Type AC program instead. In 1978 and 1979 a total of $651,426 was devoted to eight "New Directions" grants. Other ACS-PRF programs continued in effect under the terms stated in the 1978 ACS annual report.

The "23rd Annual Report on Research under Sponsorship of The Petroleum Research Fund," published in May 1979, contained 672 technical progress reports on PRF-assisted projects for the year ending Aug. 31, 1978, and a bibliography of 859 articles acknowledging PRF support. As is customary, copies of the report were distributed to the donors of the fund, principal investigators on PRF projects, libraries, members of the research community, and the public at large.

Distribution of 1979 funds authorized for new and continued ACS-PRF grants

Type of grant	Number of proposals submitted	Number of grants recommended[a]	Amount recommended	% of total funds
AC	451	136	$ 4,051,904	67.3
B	111	46	593,872	9.9
G	206	111	1,110,000	18.4
SEO	39	22	68,800	1.1
New Directions	32	2	194,000	3.2
TOTAL	839	317	$ 6,018,576	100%

a Listed in C&EN Jan. 8, 1979, page 35; April 3, 1979, page 56; and June 18, 1979, page 33.

AWARDS ADMINISTERED BY ACS

The Priestley Medalist for 1979 was Glenn T. Seaborg, Lawrence Berkeley Laboratory, University of California, Berkeley. Other recipients of 1979 ACS Awards were announced at the fall 1978 national meeting (C&EN, Sept. 11, 1978, page 42). Recipients of 1980 ACS Awards were announced at the fall 1979 national meeting (C&EN, Sept. 10, 1979, page 62).

The ACS Board of Directors accepted the offer of an anonymous donor to sponsor the ACS Award for Nuclear Chemistry on a biennial basis beginning in 1981, for five presentations. In even-numbered years the award is sponsored by EG&G ORTEC. The Peter Debye Award in Physical Chemistry, last presented in 1976, was reinstated with E. I. du Pont de Nemours & Co. as its new sponsor. The first presentation under Du Pont's sponsorship will occur in 1981. The ACS Award for Creative Invention sponsored by the Corporation Associates, the ACS Award in Petroleum Chemistry sponsored by Lubrizol Corp., the ACS Award in the Chemistry of Plastics & Coatings sponsored by Borden Foundation, and the James Flack Norris Award in Physical Organic Chemistry sponsored by the ACS Northeastern Section were renewed by their sponsors.

The Priestley Medalist for 1980 is Milton Harris (C&EN, July 9, 1979, page 30).

SCHOLARSHIPS ADMINISTERED BY ACS

The society awarded George E. Frederick Jr. Scholarships of $1000 each to students selected by three colleges that administer the scholarships under agreements with ACS: Beloit College, Coe College, and Pomona College.

BOOKS & JOURNALS

Despite unchecked inflation on the national scene, the Books & Journals Division had a successful year financially in 1979. Revenues increased substantially, primarily from subscriptions, book sales, and short-term investments. The financial prospects for the division looked good enough that the ACS Board of Directors approved another reduction in the page charge rate for the research journals in 1980.

Book publishing activities expanded to 44 new titles this year, as compared with 34 in 1978. The current number includes 12 volumes in the Advances in Chemistry Series, 29 in the ACS Symposium Series, and three other titles.

Unit sales of books increased 28% to a new high of 70,152 copies—including 1886 copies of books published by The Chemical Society (London). Gross sales revenue for the Books Department rose 24% over 1978, to $1.3 million. Royalties paid to ACS divisions on sales of symposium books increased 42% to $49,407.

Outstanding in 1979 were large shipments of standing orders for new titles in the Advances in Chemistry Series and the ACS *Symposium Series* to the People's Republic of China. Meanwhile, distribution agreements with West Germany, Japan, and the U.K. continued to operate successfully.

The computer photocomposition of two additional journals—*Biochemistry* and *The Journal of Organic Chemistry*—was transferred from Mack Printing Co. to the society's Chemical Abstracts Service division. The conversion schedule will be completed when the photocomposition of *Chemical Reviews* and the *Journal of the American Chemical Society* is transferred in 1980.

Four special issues of *The Journal of Physical Chemistry* were published during 1979. Three of the issues were dedicated to specific individuals—Don Louis Bunker, E. Bright Wilson Jr., and Sam I. Weissman. The other special issue contained most of the papers presented at a symposium on the current status of the kinetics of elementary gas reactions held at the National Bureau of Standards in June 1978.

In 1979 the *Journal of the American Chemical Society* completed 100 years of uninterrupted publication. The anniversary was celebrated at a dinner held during the national ACS meeting in Washington, with the current editor, Cheves Walling, and three former editors, W. Albert Noyes Jr. (the featured speaker), Marshall Gates, and Martin Stiles, in attendance.

Jerome A. Seiner was named editor of *Industrial & Engineering Chemistry Product Research & Development* following the untimely death of Howard L. Gerhart, who had served as editor since 1968.

The Subcommittee on Journals Monitoring, set up by the society Committee on Publications (with one member representing the Science Commission) to monitor the intellectual health of ACS journals, had four task forces at various stages of work during the year. The task force to monitor *The Journal of Physical Chemistry* completed its report and, at year's end, the group monitoring the *Journal of the American Chemical Society* was nearing the end of its deliberations, and task forces were named to monitor *The Journal of Organic Chemistry* and *Chemical Reviews*.

Herbert A. Laitinen served the last of his 14 years as editor of *Analytical Chemistry*, giving the reins over to George H. Morrison of Cornell University in 1980. In addition, a new position of executive editor was established to coordinate the editorial and business aspects of the publication, and continued emphasis in the magazine section was given to more practical problem-solving editorial material designed to meet the needs of the readers.

In 1977 the society Committee on Publications gave *Chemistry* magazine two years to establish its viability by substantially increasing its subscriptions and proving its acceptability to the public. In 1979, the magazine changed its name to *SciQuest* and radically revised its editorial policy. Subscriptions increased some

10,000 with many of them coming from members of the lay public. Because of the magazine's impressive performance, the board accepted the 1980–84 fiscal forecast for *SciQuest* as a five-year plan for operation of the magazine.

Environmental Science & Technology, which held a relatively constant circulation base in 1979, published more editorial pages and more advertising pages than in 1978. A market study to assess the editorial focus of *ES&T* was begun and scheduled for completion early in 1980.

CHEMTECH proved to be ahead of its time in selecting as its 1979 theme "The Innovative Process," a subject on which Congress and the White House spent a great deal of time during the year. *CHEMTECH*'s breadth was exemplified by the variety of subjects covered in its feature articles. They ranged from Pilkington's implementation of the float-glass process through Intel's development of integrated circuits to Zeocon's introduction of a variety of controlled-release drugs.

A 10-year retrospective study of the Microforms and Back Issues Program, completed in 1979, showed steady growth in both income and circulation. Income grew to $602,650 in 1979, compared with $157,800 in 1970. Microform customers, numbering 834 in 1970, totaled 4200 at year's end.

The division's sales office staff made 140 sales presentations at approximately 75 sites in 14 major U.S. cities. The installation of a 24-hour toll-free number (800-424-6747) and acceptance of Master Charge and Visa credit cards greatly enhanced the sale of the division's products.

Publications circulation development, funded from publications rather than membership dues, undertook some 80 direct-mail promotional campaigns involving more than 2.1 million pieces of mail. This activity accounted for more than 39,000 new subscriptions to ACS publications. In addition, a new subscription-renewal program that resulted in increased renewals for all the publications was implemented.

A separate program for audiovisual products was expanded in 1979. Direct-mail activity was begun in the second half of the year, and 37 tests providing information on product users were conducted. The division added 21 new titles, many of which are useful to scientific disciplines other than chemistry.

A final report was issued on the investigation of an alternative journal format—a "condensed" version of *JACS*, which contained the same communications and book reviews as the regular journal but only headings and author abstracts of the full articles. A large-scale mail questionnaire survey showed that 60 to 70% of existing *JACS* subscribers and about 75% of nonsubscribers favored publication of the condensed version in addition to the regular journal. However, the society Committee on Publications was concerned about possible adverse effects on *JACS* and disapproved the alternative form.

During the year, investigation of potential uses for the primary journal data base (created during the photocomposition process) continued, with emphasis on the on-line access to information contained in the journals' text. An on-line experiment will be conducted early in 1980.

A computer-based reviewer selection and manuscript control file for *Biochemistry* was designed, programmed, and installed in the editorial office. Personnel were trained in its operation and it was working successfully by midyear.

ACS publications data, 1979

Publication/editor	Total papers Received 1978	Total papers Received 1979	Total papers Published 1978	Total papers Published 1979	Editorial pages 1978	Editorial pages 1979	Paid subscriptions 1978	Paid subscriptions 1979	Subscription rates (domestic 1979) Member	Subscription rates (domestic 1979) Nonmember
C&EN, Michael Heylin	—	—	—	—	1916	2040	125,947	128,133	$10.35	$ 19.00
SciQuest	—	—	30	30	328.5	352.7	33,490	47,456	9.00[a]	12.00[b]
CHEMTECH, Benjamin J. Luberoff	—	350	—	111	786	796	15,614	15,291	17.00	25.00[c]
J. Phys. Chem. Ref. Data, David R. Lide	—	—	—	—	1812	1354	1,215	1,175	25.00	100.00
Anal. Chem., Herbert A. Laitinen	993	976	587	612	3115	3322	30,947	30,590	12.00	16.00[d]
ES&T, Russell F. Christman	311	338	167	181	1264	1,366	17,660	17,354	16.00	24.00[e]
Accounts Chem. Res., Joseph F. Bunnett	70	98	71	66	528	503	9,719	9,316	14.00	56.00
Chem. Rev., Anthony Trozzolo	28	33	22	21	682	602	5,454	5,473	17.00	68.00
I&EC Quarterlies										
Process, Hugh M. Hulburt	169	192	99	128	601	783	5,288	5,204	10.00	40.00
Fundamentals, Robert L. Pigford	148	149	72	88	393	463	5,142	4,967	11.00	44.00
Product, Jerome A. Seiner	81	161	76	79	395	400	5,004	4,853	10.00	40.00
JA&FC, Philip K. Bates	459	425	390	368	1533	1,482	5,030	5,090	12.00	48.00
JC&ED, Bruno J. Zwolinski	171	191	128	126	385	413	1,962	1,962	20.00	80.00
Biochemistry, Hans Neurath	1439	1448	894	900	6038	6,169	6,839	6,845	32.00	128.00
Inorg. Chem., M. Frederick Hawthorne	1009	1102	821	819	3854	3,760	4,716	4,721	36.00	144.00
JACS, Cheves Walling	3064	3060	1920	1790	8555	8,026	14,577	14,236	42.00	168.00
JCICS, Herman Skolnik	91	108	49	63	257	293	2,209	2,209	11.00	44.00
J. Med. Chem., Philip S. Portoghese	529	588	295	324	1432	1,649	4,350	4,308	21.00	84.00
J. Org. Chem., Federick D. Greene	1561	1687	1361	1330	5261	5,240	9,892	9,997	32.00	128.00
J. Phys. Chem., Bryce Crawford Jr.	871	1069	607	677	3017	3,637	4,625	4,502	32.00	128.00
Macromolecules, Field H. Winslow	334	410	274	279	1346	1,286	2,378	2,373	24.00	96.00
Books Department, M. Joan Comstock	741	625	529	691	8980	13,707	—	—	—	—

a All individuals. b Institutions. c Nonmember personal use; price to institutions is $85. d foreign, except Canada, $18. e Nonmember personal use; price to institutions is $64.

ACS meeting in Hawaii...

Delegation from People's Republic of China attended meeting in Honolulu

ACS president Gardner Stacy presided over opening ceremonies

Board chairman William Bailey at council meeting

. . . and in Washington

President-elect James D'Ianni at council meeting

Former JACS editor W. Albert Noyes Jr. addresses JACS 100th anniversary celebration

Membership booth at ACS exposition

Board member Pauline Newman

CHEMICAL ABSTRACTS SERVICE

Chemical Abstracts Service in 1979 continued to expand marketing activities and intensified efforts to identify and respond to needs for new information services that might be derived from the CAS data base and processing system.

During 1979 a formal new ventures operation was set up to evaluate and test ideas for new publications and services; a field sales force was organized and trained; an international marketing office was opened in Frankfurt, West Germany; pricing and marketing policies for existing publications and services were re-evaluated and altered where appropriate; and advertising and promotion efforts were stepped up. Partly as a result of expanded marketing efforts, 1979 revenues exceeded projections.

Particular emphasis is being given to identifying and developing "customer-defined" services that can be derived readily from the CAS data base. Two such services were produced during 1979. In one, CAS provides two special bulletins of abstracts for Exxon Research & Engineering Co. The contents of these bulletins are selected by computer searches of the CAS data base with profiles that define Exxon's specific interests in two broad chemical areas. In the other, CAS is helping scientists and engineers in a number of companies in the petroleum industry to keep abreast of new developments in petroleum chemistry, energy technology, and related chemical and chemical engineering topics by searching the computer files of information processed for current issues of *Chemical Abstracts* and selecting from them abstracts of interest to particular individuals. Computer printouts of selected abstracts are mailed to participants every two weeks.

CAS also continued to expand its *CA Selects* service, which makes abstracts of current publications and patents on specific chemical and chemical engineering topics available in inexpensive biweekly bulletins. The number of topics included in the service increased from 76 in January 1979 to 110 in January 1980.

One result of the re-evaluation of marketing and pricing policies is an experiment in which small colleges are being offered grants of up to $4000 toward purchase of *Chemical Abstracts* and certain other CAS publications and services. The grants are expected to bring CAS publications and services within the reach of hundreds of colleges that could not otherwise afford them and give more undergraduate students an opportunity to become familiar with them (C&EN, Jan. 28, 1980, page 55).

To provide greater flexibility in responding to the changing environment in which it now operates, CAS in 1979 consolidated its internal operations into four organizational units: Publications and Services, which combines document acquisition and selection, editorial operations, and data processing and production operations; Research and Development; Marketing; and Business Administration. Decision-making responsibility has been centralized in a seven-member management board.

CAS is working on a computer system that promises to make on-line searching of the Chemical Registry possible

The number of documents cited in *Chemical Abstracts* passed the half-million mark for the first time in 1979. A total of 515,741 papers, patents, and other documents was cited during the year, an increase of 3.4% over 1978.

Structure records of 346,062 new substances were added to the files of the CAS Chemical Registry System during 1979. The total number of substances in the registry files was approaching 4.8 million at year's end. The associated nomenclature file contained almost 7.5 million names.

CAS continued to operate private registries for the National Cancer Institute and the Warner-Lambert/Parke-Davis pharmaceutical research division. Work began during the year on the development of another private registry for a large industrial organization.

Late in the year, CAS received a grant from the Council on Environmental Quality, the Environmental Protection Agency, and the National Library of Medicine to study the feasibility of adding chemical substances indexed in *Chemical Abstracts* prior to startup of the registry in January 1965 to the registry files. Numerous substances, possibly numbering in the millions, were indexed prior to 1965 and have not been mentioned in the literature since. Registering substances from earlier *CA* indexes would enhance the registry's usefulness by making it a nearly complete listing of known substances.

Work continued on the development of a system that promises to make it possible to search the registry files on-line to identify substances that contain particular combinations and arrangements of atoms and bonds embedded within their structures. A pilot version of this substructure search system is expected to be in experimental use during the last half of 1980.

Research and exploratory work in other areas was expanded significantly in 1979, focusing both on ideas and techniques applicable to new services and on procedures for further automating information processing at CAS. Studies were under way on approaches to providing automated assistance to searchers in formulating information-retrieval queries and on possible applications of computer translation of chemical names to connection tables as a technique for entering substructure search questions in a computer search system. Work also was under way on an automated patent processing support system that will draw upon computer files created by the International Patent Documentation Center in Vienna to select patents for coverage in the CAS data base. The research and development staff also undertook a major

Chemical Abstracts publication record, 1970–79

Year	Volume	Documents cited	Pages[a]
1970	72,73	309,742	48,713
1971	74,75	350,105	51,585
1972	76,77	379,048	54,054
1973	78,79	356,549	51,696
1974	80,81	375,663	52,984
1975	82,83	454,245	62,969
1976	84,85	458,508	65,591
1977	86,87	478,225	68,496
1978	88,89	498,559	68,638
1979	90,91	515,741	73,343[b]

a Includes pages in volumes of abstracts published during the indicated year plus pages in the volume indexes for those abstract volumes, some of which are published in the year following that in which the volume of abstracts appears. b Includes estimate of pages in indexes for Vol. 91, which will be published during 1980.

study of automatic spelling error detection and correction in large data bases under a National Science Foundation grant.

Work was completed early in the year on the Toxic Substances Control Act Initial Inventory, which CAS compiled under contract for the Environmental Protection Agency. Registry files and substance identification techniques were used to identify 43,278 unique substances for the initial inventory from among more than 120,000 individual reports submitted by industry on substances manufactured or imported for commercial use in the U.S. A supplement to the inventory issued later in the year listed another 2928 substances.

On Sept. 1, the Japan Association for International Chemical Information assumed responsibility for the marketing and distribution of all CAS publications and services in Japan. The Japanese organization had been marketing CAS computer-readable files in Japan since 1977 under an agreement that called for it to take over the marketing of all CAS publications and services once it had built up the necessary staff and resources.

Internationale Dokumentationsgesellschaft fur Chemie in West Germany, the Chemical Society in the U.K., and France's Centre National de l'Information Chimique continued to pay a share of CAS operating costs and market CAS publications and services in their nations under cooperative agreements. The Chemical Society Information Services also prepared abstracts and index entries for British papers and patents for input to the data base.

CAS received its first order for computer-readable files from the People's Republic of China during 1979. The Chinese Society for Chemical Industry in Beijing requested and was granted licenses to use five CAS files. Exchanges of journals with Chinese scientific and technical organizations also continue to expand. At year's end CAS was receiving 49 Chinese journals, and another 38 had been identified and requested.

OTHER ACS OPERATIONS

CHEMICAL & ENGINEERING NEWS

During 1979 C&EN staff members worked to improve the magazine's week-to-week coverage of chemical science and technology, of the chemical industry, and of the federal government's impact on all aspects of the chemical world. The year also brought a major effort to upgrade the magazine's coverage of the broader aspects of the interface between chemistry and the chemical profession on the one hand, and society at large on the other. This involved expansion of the magazine's program of special reports and news features.

In moving in these two directions the magazine met the editorial objectives it set for itself for 1979. For instance, the first edition of "Facts & Figures of Chemical R&D" was published in the July 23 issue. This detailed analysis of data on this country's R&D effort, especially in chemistry, will become a permanent addition to the magazine's series of annual statistical presentations. The Nov. 23 issue contained an extensive preview of "Chemistry in the 1980's." This carried articles by George Hammond, William O. Baker, Ralph Landau, Carl Gerstacker, and Alan McClelland. During the year the magazine also revived its News Forum series with a debate in print, in the April 23 issue, of the issue of "Has environmental regulation gone too far?"

Other special reports published during the year were concerned with photosynthesis and plant productivity, hydride reductions, nutrition and health, fusion power, photochemistry, hazards of the chemical industry, and the chemical industry in China. And staff-written news features covered nuclear waste disposal, Dow Chemical's analytical work on dioxin, chemical waste disposal, the social thermodynamics of Ilya Prigogine, politics and the world's raw materials, synfuel developments, and the ozone layer.

Late in the year the magazine boosted its editorial staff to 27 with the addition of new staff members to the groups reporting on both government activity and on science and technology. Also late in the year the position of business manager was created and staffed.

Financially the magazine continued in sound condition in 1979. A substantial increase in income from advertising kept C&EN in the black for the fourth consecutive year.

PUBLIC AFFAIRS

1979 was a year of change and transition in the Department of Public Affairs (DPA). A major reorganization consolidated the former Department of Chemistry & Public Affairs and the Department of Public & Member Relations into one new Department of Public Affairs (DPA), under the direction of Robert G. Smerko. Staff responsibilities also were reorganized to some extent. These actions were taken to enhance the effectiveness of the society's public affairs activities.

Federal regulatory activity. The department worked to develop better communications with ACS divisions that have special interests in federal regulations. The Divisions of Analytical Chemistry, Environmental Chemistry, Industrial & Engineering Chemistry, Medicinal Chemistry, and Pesticide Chemistry established liaisons with DPA in 1979.

DPA assists the divisions by monitoring pertinent regulatory issues and keeping the divisions informed of their current status; informing the divisions of pertinent ACS activities; alerting them to possible ACS nominations for membership on federal advisory boards, committees, and other outside groups; and transmitting to the divisions the department's biweekly *Washington Alert*.

Intersociety review of federal R&D budget. ACS participated for the first time in a review of funding for R&D in the President's budget for fiscal year 1980, sponsored by the American Association for the Advancement of Science. Two reports were prepared on this subject in 1979.

ACS policy statements and communications. During 1979, ACS issued 19 board-approved policy statements. Six of these went to regulatory agencies, including three to Douglas Costle, Environmental Protection Agency Administrator, to give ACS's views on EPA's plans for implementing various portions of the Toxic Substances Control Act (TSCA).

In the legislative arena, three statements to various Congressional committee chairmen explained ACS's view that a uniform federal patent policy is needed; ACS president Gardner W. Stacy re-emphasized this point in testimony before the House Subcommittee on Science, Research & Technology on Oct. 17.

Several statements dealt with federal budgetary matters—increased funding for the Patent & Trademark Office was recommended, as well as restoration of postharvest technology research funds cut from the Department of Agriculture budget. Support for the President's increase in research funding, and support for continuation of the type of long-term research supported by the National Science Foundation's "Chemical Threats to Man and the Environment" program rounded out ACS's comments on the federal 1980 budget.

Other ACS statements supported a proposed National Academy of Sciences study on establishing a uniform federal cancer policy; opposed transfer of the NSF Science Education Directorate to the new Department of Education; called for an incentives program to encourage private investment in R&D, which would thereby stimulate industrial innovation; supported by Sen. Kennedy's bill on equal opportunity for women in science and technology; and, finally, expressed some concerns about the "National Publications Act of 1979" that had been voiced by the membership.

Member-related programs. DPA made a special effort in 1979 to encourage greater involvement by the ACS membership in public affairs activities of the society. Two DPA programs are designed to bring this about: the Congressional science counselor program and the local section public affairs coordinator program.

Several steps were taken to strengthen the Congressional science counselor program. A bimonthly *CSC Newsletter*, which began publication in February, contains information on such subjects as "Getting to Know Your Legislator" and the makeup of the 96th Congress. An article on "Lobbying and the CSC Program" explained what the counselors can and cannot do in working with their legislators in order not to violate the tax rules ACS operates under as a nonprofit scientific and educational organization.

Early in 1979 the sections were asked to appoint public affairs coordinators to serve as contacts in the sections on public affairs matters. Suggestions and information are sent to the coordinators to assist them in their public affairs work. Attention was called to the new ACS bylaw IX, which explains procedures by which ACS units can issue their own policy statements. In turn, the sections are encouraged to call ACS's attention to matters in which they think the society should be involved.

Short articles on public affairs topics also are sent to section newsletters for publication. Articles to date include one on how ACS policy statements are developed, and one on environmental action in local communities. Information packets are put together for distribution at local section conferences to acquaint incoming section chairmen with DPA's programs and activities.

DPA publications. A study titled "Chemistry and the Food System" was written in 1979 and will be published in March 1980. It covers the entire spectrum of chemistry's role in the food system from farm to table.

Public affairs symposia. Two public affairs symposia transcripts were published during the year—"Materials and National Policy" and "Food from the Chemical Viewpoint." The "food" symposium was especially well received, and the initial press run has since been exhausted. A symposium on "Science and Technology Policy in Japan and the United States" was held at the spring national meeting in Honolulu.

Fellowship program. The ACS fellows for 1979–80 are David L. Eck, chairman of the department of chemistry at Sonoma State University, and Stephen D. Ziman, a senior research chemist at Chevron Chemical Co. The fellows have accepted staff positions on Capitol Hill with the House Committee on Science & Technology. Eck is working with the Subcommittee on Energy Development & Application, and is responsible for the Biomass Research & Development Authorization Act. Ziman has been working on the issue of innovation and productivity, and on various authorizations.

Environment. The ACS Committee on Environmental Improvement (CEI) will sponsor jointly with the Division of Environmental Chemistry a series of symposia on the chemical aspects of energy use, to be held at future national meetings. CEI also has developed a priority list of actions in the areas of air, water, wastes, pesticides, radiation, and chemical monitoring and analysis. The list will be used as the basis for future committee involvement.

CEI worked on its "Guidelines for Data Acquisition and Data Quality Evaluation in Environmental and Trace Analytical Chemistry," which establish minimum requirements for reliable chemical analysis of environmental samples with emphasis on trace organic analysis. The guidelines include minimum requirements needed to obtain data that are likely to satisfy validation criteria such as precision, accuracy, and limits of detection.

DPA staff began to identify ACS members whose principal area of interest is the environment in order to develop a roster of environmental chemists who would assist in reviewing proposed legislation and federal agency regulations, serve on government committees, and provide greater focus for the society's environmental actions.

PUBLIC RELATIONS

The society's second planetarium show, "Springtime of the Universe," premiered in June at the Hansen Planetarium in Salt Lake City and was released for general distribution in November. By year's end, several ACS local sections had built meetings around local showings. "The Loneliness Factor," the first ACS planetarium show, had been seen by nearly 16 million persons at some 500 planetariums worldwide by the end of 1979.

A science documentary for radio based on "The Loneliness Factor" and titled "Are We Alone in the Universe?" was carried on some 140 broadcasts heard by an estimated audience of 7 million. Many of the broadcasts were arranged or promoted by local sections. Two radio public-service announcements were distributed each month of the year to some 2800 stations, and a special series of these announcements for exclusive distribution by local sections was nearing completion by year's end. Topics included vitamins, lightweight clothing, synthetic lubricants, and "chemists are human, too." Man and Molecules, the oldest radio science series in the U.S., entered its 19th year of continuous production and was aired by some 500 stations to a weekly audience estimated at 6 million to 8 million.

The Washington national meeting gave rise to the largest number of newspaper clippings—2192, of which 251 were on page one—since the ACS Centennial in 1976, accounting for a near-record 32,618 column inches. These were based on both news releases and press conferences. By contrast, the Chemical Congress in Honolulu, because of its remote location and time differential, resulted in only 387 clippings, 11 page-ones, and 4277 column inches. Another 68 stories generated by the ACS News Service during the year resulted in some 1800 additional clippings; subjects included ACS national elections, award winners, regional meeting papers, and the Inter-Society Energy Conversion Engineering Conference.

One of the most popular made-for-TV film clips ever produced by the News Service was based on a paper given at the Washington national meeting that shed new light on the origin of life. This clip was telecast by all the major networks and was placed with many local TV stations by ACS local sections.

"The Chemist and the Public," a handbook for local section public relations chairmen, was revised and sent to the 1979 chairmen. Preliminary work began on a film about chemistry in medicine and on a new planetarium show on DNA and recombinant DNA. Roy Avery, head of the Public & Member Relations Department since 1973 and a staff member for 29 years, retired at year's end.

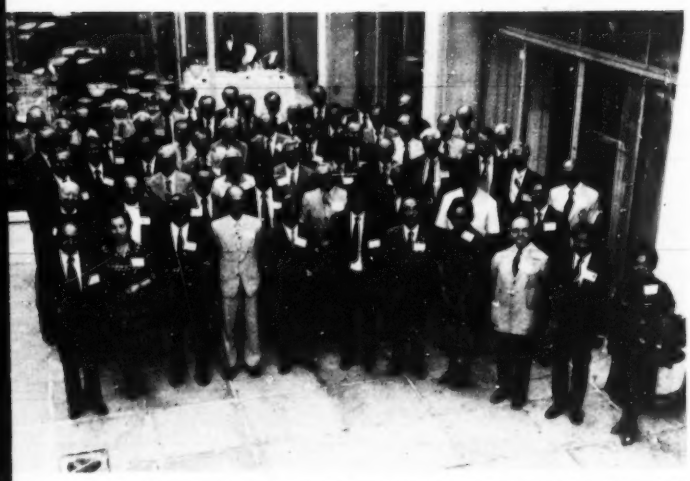
INTERNATIONAL ACTIVITIES

Immediately following the ACS national meeting in Washington, ACS served as host for the 7th International Meeting of Chemical Society Presidents. The meeting was organized by Gardner W. Stacy and a subcommittee of the society's International Activities Committee (IAC) composed of William J. Bailey (chairman), Robert B. Fox, Jesse C. H. Hwa, and Bryant Rossiter. Staff support was provided by the Office of International Activities. Thirty-six societies from 33 countries were represented, as were regional chemical associations in Africa, Asia, and Europe.

During the business meetings, the presidents discussed the role of chemistry and of chemical societies in the transfer of science and technology among nations, developments in the registration and licensing of chemists, relationships between universities and the chemical industry, and chemistry's role in the provision of energy.

Science and technology exchange/India. In April, the National Science Foundation approved a grant of $36,000 to ACS to support a workshop to be held in India in cooperation with the Indian Chemical Society. Devoted to natural products chemistry, organometallic chemistry, and solid-state chemistry, the 13-day workshop will be held in January 1980 to discuss the latest research in India and in the U.S. in the three subjects and to prepare proposals to seek support for research and development projects to be conducted in the two countries.

Science and technology exchange/Egypt. Two of eight research and development projects recommended during a workshop held late in 1977 in cooperation with Egypt's National Research Centre were implemented by the Agency for International



Presidents of 32 chemical societies from 33 countries attended 7th International Meeting of Chemical Society Presidents

Development in 1979. One deals with improvements in the process used in Egypt to scour wool and refine the recovered wool wax into useful products for markets in Egypt. The other is devoted to formulating corrosion inhibitors using native Egyptian raw materials, to lessening corrosion in Egypt's petroleum refineries, and to establishing a first-class corrosion research laboratory at the National Research Centre. Four Americans visited Egypt in January to help prepare detailed R&D programs for the two projects, and by late spring work began on both at the center's laboratories in Cairo.

International chemical society. At the ACS/CSJ Chemical Congress in Honolulu in April, IAC held an open forum during which chemists from a number of countries discussed formation of an international society to which chemists might belong as individuals. It also served as host at a dinner there during which presidents or representatives of chemical societies in 10 countries bordering the Pacific Ocean had a similar discussion. Support for the concept proved generally to be strong, although everyone agreed that skillful planning will be required to form a successful organization. The most significant single action taken during the chemical society presidents meeting, meantime, was agreement to establish an international committee to consider the formation of such a society.

Delegation from China. The Chinese Academy of Sciences accepted an invitation to attend the ACS/CSJ Congress and 12 directors and deputy directors of the academy's major institutes attended the meeting and then toured university, government, and industrial laboratories in eight states and Washington, D.C., during the two weeks following. Discussions also were held by the delegation's leaders and ACS officers and staff on ways in which contacts between the two organizations could be enhanced.

Scientific freedom/human rights. In September 1978, the board voted to accept the invitation of the American Association for the Advancement of Science to investigate cases of alleged violations of the scientific freedom and/or human rights of chemists in other countries. The first cases considered were those of Drahoslav Lím, a chemist seeking to be allowed to emigrate from Czechoslovakia, three chemists in Argentina who are reported to have been arrested but who have not been heard from since, and a chemist in the U.S.S.R. who wished to emigrate. Lím was allowed to emigrate in 1979, but the others' cases were unresolved at year's end.

Berzelius scroll. At the Washington meeting of chemical society presidents, ACS presented scrolls to attending presidents or their representatives in honor of the 200th anniversary of the birth of Jöns Jacob Berzelius. In December, Glenn T. Seaborg had a personal audience with His Majesty Carl XVI Gustaf, King of Sweden, and presented a special scroll on behalf of ACS honoring the famous Swedish chemist.

GOVERNING BODIES

BOARD OF DIRECTORS

Mary L. Good was elected chairman of the ACS Board of Directors for 1980 at the board's December meeting in Washington. She succeeds William J. Bailey, who in turn succeeded her in 1979. Other board members elected or re-elected in 1979 to three-year terms beginning in 1980 were Albert C. Zettlemoyer, president-elect; William J. Bailey and Robert W. Parry, directors-at-large; Gordon L. Nelson, Region I; and Bernard S. Friedman, Region V.

Brief summaries of the board's meetings in April and September appeared in C&EN for April 23, page 55, and Sept. 24, page 50. Official reports from the June and December meetings were in C&EN for July 16, page 27, and Jan. 21, 1980, page 58. In addition to actions reflected elsewhere in this report, the board also:

- Approved a modified $51 million 1979 general fund budget with a net deficit of $223,000.
- Approved a Petroleum Research Fund budget for 1980 of $6.4 million.
- Took no action on a proposed budget for 1980 because several requests for major additions required further review by the Committee on Budget & Finance.
- Approved an edited version of a new statement of ACS goals, later confirmed by the Council Policy Committee.
- Authorized establishment of a task force to study the feasibility of creating a corporation to assist small chemical businesses.
- Raised the registration fee for the fall 1980 national meeting in San Francisco to $55, rescinding an earlier $50 fee.
- Approved in principle establishment of a joint task force to facilitate interaction between ACS and the American Institute of Chemical Engineers.
- Voted that ACS should offer to have an official testify orally at Congressional hearings on the 1980 budget for the Department of Agriculture's postharvest research.
- Approved distribution of $39,500 of ACS Corporation Associates dues revenues for various projects in 1980.
- Authorized creation of a special committee to plan for the establishment of an ACS Foundation for the Support of Research in Chemical Science.
- Authorized establishment of a board task force to explore ways of improving industrial/academic cooperation.
- Authorized establishment of a new, enlarged ad hoc committee to examine the possibility of creating a museum of chemistry in an ACS building, either existing or to be built.

COUNCIL

There were 490 voting members of the council in 1979, the same as in 1978. Included were 364 representing local sections, 89 from divisions, and 37 ex officio. Summaries of the two council meetings during 1979 appeared in C&EN, April 9, page 6; April 23, page 54; and Sept. 24, page 48. Five petitions up for council action at the spring meeting in Honolulu were explained in C&EN, March 19, page 57, and 13 petitions for the fall meeting in Washington were detailed in C&EN, Aug. 20, page 26.

One action affecting nearly all ACS members was a $3.00 increase in national dues for 1980 to a total of $48. This was $1.00 less than it would have been under the automatic escalator, which the council overrode after lengthy discussion of the finances of

ACS BOARD OF DIRECTORS

Chairman: William J. Bailey

Ex Officio:
Gardner W. Stacy, president
James D. D'Ianni, president-elect
Anna J. Harrison, past-president
Raymond P. Marleila (nonvoting)

Regional:
Gordon L. Nelson (I)
Patricia A. Figueras (II)
Warren D. Niederhauser (III)
Mary L. Good (IV)
Herman S. Bloch (V)
Richard M. Lemmon (VI)

Directors-at-large:
William J. Bailey
Clayton F. Callis
Pauline Newman
Robert W. Parry
Paul V. Smith Jr.
Albert C. Zettlemoyer

dues-supported activities. Another financial matter was an increase of $70 in the base allotment to local sections from ACS national funds for a total of $1060 for each section in 1980; although the councilors voted unanimously for the increase, it would have taken place automatically, and they needed to vote only if they wished a smaller increase.

Of the four petitions passed at the Honolulu meeting, the one generating the most discussion called for an addition to the ACS constitution that would formally recognize ACS international activities as an object of the society. The amendment subsequently was ratified by the ACS membership in a mail ballot.

The three other petitions approved by the council in Honolulu involved bylaw amendments (all later confirmed by the ACS Board of Directors) that concerned husband-wife dues, nomination and election procedures, and duties of certain council committees. In other action, the council declared valid a contested election for director from Region VI (C&EN, Nov. 20, 1978, page 6) in which the successful candidate won by three votes.

At the fall meeting, the council figuratively entered the electronic age when it experimented with an electronic system for the rapid tallying of votes. Although the system was used only when the outcome of a voice vote was in doubt, it was considered successful.

Ten of the 13 petitions up for council action in Washington were approved, one was defeated, and two were recommitted. All involved bylaw amendments and five also included changes in the ACS constitution. All those approved were subsequently confirmed by the ACS Board in the case of bylaw changes or ratified by the membership in the case of constitution changes, as required.

The defeated petition dealt with a proposed change in requirements for emeritus status that mainly would raise from 35 years to 40 the length of paid membership needed to qualify. The recommitted petitions were concerned with membership requirements and application procedures. The approved petitions involved the time requirement for half-dues memberships, changes in councilor representation, dues billings, local section allotments, section and division annual reports, the Committee on Professional Training, and housekeeping matters. In other actions, the council:

- Approved experiments in the fall national elections that would provide data on factors that might influence member voting response. Members were asked to indicate when they received their ballots, which had been mailed third class as usual, and half of the members in Region I got postage-paid return envelopes.
- Approved tentative plans to schedule 1985 national meetings in Miami Beach and Chicago.

TREASURER'S REPORT

The society's performance in 1979 further strengthened its sound operating and financial position. Increased revenues in generally all areas, in particular subscriptions and sales by the Chemical Abstracts Service division, and significantly increased investment revenues created a very positive effect on the society's operation and turned a budgeted deficit into a surplus of more than $2.4 million (more than $3.0 million if we include realized capital gains from investments).

Although some areas of operations moderately exceeded their expense budget, this was the result of additional production necessary to provide our favorable revenue increases. Continued close attention to cost containment in the current high-inflation economy maintained overall expenses virtually at the budgeted level.

After adjusting the net of revenues over expenses for debt retirement, depreciation, and equipment acquisitions, we will add approximately $2.9 million to the society's liquid reserve, bringing it to the $19.0 million mark. This, in turn, is about 30% of our expense budget, and thus falls within the specified guideline established by the board of directors, specifying that liquid reserves be between 25 and 30% of annual expenses.

Special mention should be made that the society's investment program contributed $4.0 million in 1979. Of this amount, $1.7 million came from investment in short-term money market instruments and $2.3 million from participation in the Investment Pool. These returns were possible because of the high interest rates that prevailed during the year and our positioning of funds to take advantage of rising rates.

John K Crum

FINANCIAL STATEMENTS FOR 1979

The Board of Directors
American Chemical Society

We have examined the balance sheet of the American Chemical Society as of Dec. 31, 1979, the related statement of revenue, expenses, and fund balances, and the related statement of expenses for the year then ended. Our examination was made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances. The financial statements of the American Chemical Society for the year ended Dec. 31, 1978, totals of which are included in the accompanying financial statements for comparative purposes, were examined by other auditors, whose report, dated March 19, 1979, expressed an unqualified opinion on those statements, prior to the reclassifications described in Note 1 to the financial statements.

In our opinion, the financial statements for the year ended Dec. 31, 1979, referred to above, present fairly the financial position of the American Chemical Society as of Dec. 31, 1979, and the results of operations and changes in fund balances for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Coopers & Lybrand

Washington, D.C.
March 3, 1980

AMERICAN CHEMICAL SOCIETY NOTES TO FINANCIAL STATEMENTS

1. SUMMARY OF ACCOUNTING POLICIES

Fund accounting—To ensure observance of limitations and restrictions placed on the use of resources available to the society, the accounts of the society are maintained in accordance with the principles of fund accounting. This is the procedure by which resources for various purposes are classified for accounting and reporting purposes into funds established according to their nature

and purposes. Separate accounts are maintained for each fund; however, in the accompanying financial statements, funds that have similar characteristics have been combined into fund groups. Accordingly, all financial transactions have been recorded and reported by fund group.

Prior to 1979, the assets, liabilities, and fund balances of the society were presented in four self-balancing fund groups: general; investment pool; building, land, and equipment; and restricted. In 1979, to reflect more clearly total unrestricted funds and the ownership of the assets in the Investment Pool, the society reduced the number of fund groups to two, as follows:

Operating funds—Operating funds reflect transactions related to the general operations of the society. The society's investment in land, buildings, and capitalized equipment is also included in these funds as well as the society's participation in the Investment Pool's assets (see Note 2).

Restricted funds—Restricted funds reflect transactions of various activities that are funded by contributions, bequests, contracts, grants, and board-authorized revenue transfers. The use of these funds is restricted under the terms of the applicable agreements, wills, or authorizations.

The expenses of operating and financing the society's buildings, net of rental income of approximately $168,000 and $222,000 in 1979 and 1978, respectively, are now shown as a single caption, "net building operations." Revenue and expenses of 1978 have been reclassified to reflect this change.

Inventories—Costs of books, periodicals, and materials held for sale are charged to expense as incurred.

Property and equipment—Buildings and improvements are carried at cost and are depreciated using the straight-line method. The cost of maintenance and repairs is charged to income as incurred, whereas significant renewals and betterments are capitalized.

Purchases of furniture, fixtures, and equipment for the Washington, D.C., operations are charged directly to expense. The furniture, fixtures, and equipment for the Columbus, Ohio, buildings are carried at cost and are being depreciated over their estimated useful lives. Depreciation expense for 1979 and 1978 was $1,606,197 and $2,065,858, respectively. Gains and losses on disposal of fixed assets are recognized as miscellaneous income or expense.

Grants and contracts—Grants made by the society under the Petroleum Research Fund program are paid over a number of years and are charged to expense in the year of acceptance by the institution receiving the award. As of Dec. 31, 1979, the board of directors has approved grants in the amount of $2,114,050, which are to be offered during 1980.

The society has a number of grants from and contracts with the U.S. government which primarily provide for cost reimbursement to the society. Grant and contract revenue is recognized when the related costs are incurred by the society.

2. PARTICIPATION IN INVESTMENT POOL

The society's general reserve funds, a portion of future years' revenue collected in advance, and available restricted funds, as well as reserve funds of local sections and divisions, comprise the society's Investment Pool. The society invests funds that will be required for current operating needs separately in short-term securities. The pool follows a balanced investment policy to generate both current return and long-term appreciation. Consistent with this policy, the pool invests in marketable securities, primarily corporate bonds, notes, and stocks.

Investments are recorded at cost. Interest and dividends earned are distributed quarterly to the participating funds, based on their proportionate ownership interest. Realized capital gains and losses are allocated to the individual accounts of the participants on a quarterly basis. Gains can be withdrawn only when shares are liquidated at the time of withdrawal or partial liquidation by a participant. The pool determines gain or loss on the sale of securities by the average-cost method.

At Dec. 31, 1979, and 1978, the assets of the Investment Pool were as follows:

	1979		1978	
	Cost	Market	Cost	Market
Investments:				
Cash equivalents	$13,692,294	$13,692,294	$6,789,763	$6,789,783
Bonds	6,649,308	6,059,143	6,510,744	5,963,602
Stocks	—	—	5,903,788	6,483,608
	20,341,602	19,751,437	19,204,295	19,236,973
Interest receivable	212,288	212,288	152,283	152,283
Cash	(11,331)	(11,331)	55,655	55,655
	$20,542,559	$19,952,394	$19,412,233	$19,444,911

The pool had interest and dividend income of $1,802,621 and $1,467,737 in 1979 and 1978, respectively, and had a decrease in unrealized appreciation of $622,843 and $874,389 in 1979 and 1978, respectively.

3. ACCOUNTING FOR COLLECTIVE INDEXES

The society publishes the Collective Index of abstracts every five years. The current collective period began with 1977, and the Tenth Collective will be ready for printing at the end of 1981. The cost of producing the data base for this index is incurred throughout the five-year period as an integral part of producing *Chemical Abstracts*. The printing and distribution costs are incurred after the five-year period.

The society treats the Collective Index as a joint product of the abstracts production. Accordingly, costs allocated to the index during the five-year period are deferred and reflected as "Collective Indexes in process" in the balance sheet.

Proceeds from advance sales of the Tenth Collective Index, amounting to $7,783,555 as of Dec. 31, 1979, have been reflected as deferred revenue in the balance sheet.

Deferred costs and deferred revenue of the index will be recorded as operating fund expense and revenue in the years of printing and distribution, planned for 1982 and 1983, for the Tenth Collective Index. As of Dec. 31, 1979, all revenue and expenses in connection with the Ninth Collective Index have been reflected in the operating fund revenue and expenses.

4. DUES AND SUBSCRIPTIONS RECEIVED IN ADVANCE

As a result of its billing cycle, the society receives substantial amounts of dues and subscription revenue in any given year which represent payments for services to be rendered and/or publications to be delivered during the following year. At Dec. 31, 1979, revenue applicable to 1980, amounting to $20,540,394, had been received and is reflected as deferred revenue in the balance sheet.

5. LONG-TERM DEBT

The society financed the second building and the purchase of data processing equipment at Chemical Abstracts Service division in Columbus, Ohio, by the sale of two series (1971 and 1973) of Franklin County, Ohio, Industrial Development First Mortgage Revenue Bonds in the aggregate amount of $11,200,000. As a part of the financing arrangements, the society transferred to Franklin County (and leased back) a portion of its real estate and equipment having a current net book value of approximately $9,900,000. The bonds are secured by an assignment of the lease and cash and securities, which are recorded on the balance sheet at a total cost of $565,000 and have a market value of approximately $437,500 at Dec. 31, 1979. Upon payment of all outstanding bonds, the lease provides that, at the society's option, the improved property will be returned to the society for $300. In accordance with generally accepted accounting principles, the transfer has not been recognized, and the property is considered as being owned by the society.

The lease requires semiannual rental payments equal to the interest and principal payments required by the bond maturity schedule. The bonds, $9,875,000 of which have been paid as of

AMERICAN CHEMICAL SOCIETY BALANCE SHEET
DEC. 31, 1979 (WITH COMPARATIVE TOTALS FOR DEC. 31, 1978)

	1979			
	Operating funds	Restricted funds	Totals	Totals 1978
ASSETS				
Cash	$ 184,847	$ 23,736	$ 208,583	$ 273,479
Participation in Investment Pool (Note 2)				
Society funds	18,949,623	1,326,125	20,277,748	19,121,971
Affiliated organizations	—	264,811	264,811	289,904
Short-term investments, at cost which approximates market	22,573,387	6,689,200	29,262,587	23,238,440
Accounts receivable (net of allowance for doubtful accounts of $66,089 and $53,523)	1,436,706	615,020	2,051,726	1,937,519
Advances and loans to employees	81,710	—	81,710	79,333
Investment revenue receivable	330,068	159,644	489,712	550,339
Prepaid expenses	2,351,081	—	2,351,081	2,122,957
Collective Indexes in process (Note 3)	7,539,000	—	7,539,000	5,060,835
Interfund receivables (payables)	599,545	(599,545)	—	—
Property, plant, and equipment, at cost (Notes 1 and 5)				
Land	2,494,606	—	2,494,606	2,494,606
Buildings and improvements (net of accumulated depreciation of $5,470,841 and $4,997,148)	11,584,507	—	11,584,507	11,939,091
Furniture, fixtures, and equipment (net of accumulated depreciation of $8,543,874 and $7,794,519)	2,068,827	—	2,068,827	1,714,746
TOTAL ASSETS	**$70,193,907**	**$8,480,991**	**$78,674,898**	**$68,823,220**
LIABILITIES				
Accounts payable	$ 4,276,721	$ 1,377	$ 4,278,098	$ 3,515,362
Taxes and other employee withholdings	172,357	—	172,357	47,858
Estimated income taxes payable (Note 7)	267,000	—	267,000	225,000
Other payables	395,842	—	395,842	230,252
Accrued expenses:				
Salaries and related costs	1,190,431	—	1,190,431	955,027
Other	784,962	—	784,962	758,154
Grant commitments (Note 1)	—	2,951,783	2,951,783	3,014,335
Deferred revenue (Notes 3 and 4)	28,323,949	35,276	28,359,225	23,881,623
First mortgage revenue bonds payable (Note 5)	1,325,000	—	1,325,000	1,675,000
Affiliated organizations' equity in Investment Pool (Note 2)	—	264,811	264,811	289,904
TOTAL LIABILITIES	36,736,262	3,253,247	39,989,509	34,592,515
FUND BALANCES				
Operating (Note 6)				
Building, land, and equipment	14,388,012	—	14,388,012	14,302,869
General	19,069,633	—	19,069,633	16,091,301
Restricted	—	5,227,744	5,227,744	3,836,535
TOTAL FUND BALANCES	33,457,645	5,227,744	38,685,389	34,230,705
	$70,193,907	**$8,480,991**	**$78,674,898**	**$68,823,220**

The accompanying notes are an integral part of these financial statements.

Dec. 31, 1979, bear interest at varying rates and are payable as follows:

Year(s)	Annual interest rate	Annual payment
1980–82	5.75%	$350,000
1983	5.75	275,000

6. OPERATING FUND BALANCE

The building, land, and equipment portion of the operating fund balance was increased by transfers from the general portion for debt amortization and capital acquisitions of $85,143 and $324,129 for 1979 and 1978, respectively. The excess of revenue over expenses for 1979 and 1978 affected the general balance only.

7. FEDERAL INCOME TAX

The society is exempt from federal income tax under section 501(c)(3) of the Internal Revenue Code and has been ruled by the Internal Revenue Service not to be a private foundation. Such organizations described in that section are taxable only on their unrelated business income.

Annual information and unrelated business income tax returns have been timely filed. Results of an IRS audit of the returns for 1968–70 have been satisfactorily settled in favor of the society.

AMERICAN CHEMICAL SOCIETY STATEMENT OF REVENUE, EXPENSES, AND FUND BALANCES FOR THE YEAR ENDED DEC. 31, 1979 (WITH COMPARATIVE TOTALS FOR YEAR ENDED DEC. 31, 1978)

	1979			
	Operating funds	Restricted funds	Totals	Totals 1978
Operating revenue:				
Dues, net of allocations to subscriptions	$ 3,448,898	$ —	$ 3,448,898	$ 3,188,616
Subscriptions	30,223,457	—	30,223,457	35,684,836
Advertising	4,614,285	—	4,614,285	3,942,008
Page charges	911,444	—	911,444	1,038,070
Sales and services	9,953,418	46,586	10,000,004	7,673,411
Interest and dividends	3,388,198	833,786	4,221,984	2,707,090
Grants and contracts	—	2,100,221	2,100,221	1,824,133
Distribution from Petroleum Research Trust Fund	—	6,782,159	6,782,159	6,159,453
Registration fees and other	1,968,710	319,666	2,288,376	1,629,062
	54,508,410	10,082,418	64,590,828	63,846,679
Expenses	52,086,774	8,717,226	60,804,000	58,924,823
Excess of operating revenue over expenses before realized capital gains	2,421,636	1,365,192	3,786,828	4,921,856
Realized capital gains	641,839	26,017	667,856	360,278
Excess of revenue over expenses	3,063,475	1,391,209	4,454,684	5,282,134
Fund balances, beginning of year	30,394,170	3,836,535	34,230,705	28,948,571
Fund balances, end of year	**$33,457,645**	**$5,227,744**	**$38,685,389**	**$34,230,705**

The accompanying notes are an integral part of these financial statements.

AMERICAN CHEMICAL SOCIETY STATEMENT OF EXPENSES FOR THE YEAR ENDED DEC. 31, 1979 (WITH COMPARATIVE TOTALS FOR YEAR ENDED DEC. 31, 1978)

	1979			
	Operating funds	Restricted funds	Totals	Totals 1978
Salaries and wages	$24,629,892	$1,064,678	$25,694,570	$23,210,265
Fringe benefits and other personnel costs	4,467,115	256,162	4,723,277	3,973,125
Professional and other personal services	2,584,802	15,922	2,600,724	2,153,897
Net building operations	2,337,204	129,366	2,466,570	2,365,572
Travel	1,540,548	61,032	1,601,580	1,290,347
Publications—production and distribution	9,646,998	10,597	9,657,595	10,046,458
Other printing and duplication	1,739,961	111,120	1,851,081	1,499,475
Promotion and circulation development	1,136,471	794	1,137,265	1,002,400
Apportionments and distributions to local sections	559,007	—	559,007	529,653
Meeting sites and event costs	453,402	6,040	459,442	382,244
Equipment costs and data processing	2,642,676	135,574	2,778,250	2,868,937
Grants, awards, and subcontracts	398,844	6,038,131	6,436,975	5,639,519
Office supplies and expenses	1,702,570	30,742	1,733,312	1,523,993
Other operating costs	1,289,041	26,476	1,315,517	1,006,873
Provision for income tax	267,000	—	267,000	225,000
Allocation of general administrative expense	(830,592)	830,592	—	—
Deferral of Tenth Collective Index expense	(2,478,165)	—	(2,478,165)	(2,324,835)
Ninth Collective Index—costs deferred from prior years	—	—	—	3,531,900
	$52,086,774	**$8,717,226**	**$60,804,000**	**$58,924,823**

The accompanying notes are an integral part of these financial statements.

After audit of the returns for the years 1971–74, IRS proposed revocation of the society's 501(c)(3) exemption on the basis that subscription price differentials between members and nonmembers constitute inurement. The IRS report also contains an alternative position in the event that the proposed revocation of exempt status is not upheld. This alternative assesses deficiencies totaling $274,560 for the four years. The society filed an appeal and protest on both these matters with IRS on April 27, 1978. A hearing on this appeal was held in August 1978, but no decision has been rendered to date. Management and legal counsel believe that ultimate resolution will be in the society's favor. Returns for years subsequent to 1974 have not been audited by IRS; however, in the opinion of management, adequate provision for income taxes on the unrelated business income has been made in the financial statements for these years.

8. PENSIONS

The society provides a defined-benefit, noncontributory pension plan, which is qualified under section 401 of the Internal Revenue Code, covering substantially all the employees of the society. The society's policy is to fully fund pension costs as accrued. The costs of the plan for 1979 and 1978 were approximately $1,917,000 and $1,667,000, respectively. The plan's actuaries have determined that the market value of the assets of the pension fund exceeded the computed value of vested benefits approximately $2,811,000 as of Nov. 1, 1979.

American Chemical Society: an 11-year statistical review

	1979	1978	1977	1976	1975	1974	1973	1972	1971	1970	1969
MEMBERSHIP											
Total members in good standing, Dec. 31	114,100	110,311	110,957[a]	108,744[a]	107,199[a]	105,530[a]	106,275	106,604	108,272	109,766	114,627
Unpaid members	4,114[a]	4,302[a]	4,184[a]	3,956[a]	3,621[a]	4,744[a]	4,010	4,104	3,744	4,557	2,189
Total membership	118,214[a]	116,240[a]	115,141[a]	112,730[a]	110,820[a]	110,274[a]	110,285	110,708	112,016	114,323	116,816
Membership addition during year	8,070	7,706	8,330	7,363	6,379	6,442	5,582	4,635	4,717	5,100	6,763
Membership retention	95.2%	94.9%	94.7%	94.8%	95.1%	94.3%	94.1%	94.1%	94.7%	93.7%	93.5%
Membership of divisions	48,228[b]	47,081[b]	47,425[b]	45,544[b]	45,078[b]	47,815	48,481	50,519	49,061	48,374	47,662
PUBLICATIONS											
Chemical & Engineering News											
Subscriptions[c]	128,133	125,947	124,767	123,197	121,458	120,607	121,562	125,231	129,892	132,946	136,751
Editorial pages	2,040	1,916	1,772	1,762	1,664	1,458	1,381	1,357	1,978	2,518	2,507
Analytical Chemistry											
Subscriptions	30,590	30,947	30,949	30,967	32,440	32,367	30,898	31,311	32,512	34,861	34,947
Editorial pages	3,322	3,115	3,185	3,258	3,443	3,358	3,379	3,532	2,968	2,875	2,984
Basic journals[d]											
Number of journals	12	12	12	12	12	12	12	12	12	12	12
Total subscriptions	71,032	71,751	72,305	72,514	74,487	75,126	74,018	75,571	78,655	83,193	89,567
Total editorial pages	33,060	32,888	32,690	31,713	29,872	29,871	31,366	32,445	29,806	31,052	30,881
Total papers published	6,763	6,832	6,650	6,525	6,310	6,316	6,750	6,929	6,351	6,518	6,477
Chemical Abstracts											
Documents cited	515,741	498,559	478,225	458,508	454,245	375,663	356,549	379,048	350,105	309,742	285,346
Pages	73,343[e]	68,638	68,371	65,591	62,969	54,046	51,596	54,054	50,981	48,713	44,284
ACS MEETINGS											
National[f]											
Spring: total registration	9,375	6,846	8,214	10,138	7,539	5,795	4,751	5,845	5,485	7,707[g]	6,713
Fall: total registration	9,946	6,565	7,888	9,526	6,487	6,210	7,069	7,117	8,057	8,286	11,958
Winter: total registration	—	—	—	—	3,337	—	—	—	—	—	—
Regional											
Number	9	10	8	10	6[h]	10	9	10	10	9	8
Total registration	6,524	7,789	5,934	7,280	3,675[h]	6,438	7,091	7,285	6,893	7,608	6,797
FINANCES (General Fund)											
Revenues, including realized capital gains	$55,150,249	$55,441,507	$48,087,956	$38,933,367	$33,575,790	$33,816,989	$32,357,502	$33,343,218	$29,625,920	$31,852,082	$29,065,259
Expenses, including provision for tax on unrelated business income	52,086,774	51,167,871	43,892,683	37,105,114	33,710,538	33,836,342	31,138,080	31,468,953	30,333,045	31,003,348	28,702,060
Excess of revenues over expenses	3,063,475	4,273,636	4,195,273	1,828,253	(134,748)	(19,353)	1,219,422	1,874,265	(707,125)	848,734	363,199

a Deceased members not included, as in previous years. b Paid only (comparable 1974 total was 44,797). c Excludes emeritus and life members. d Basic journals data include *Accounts of Chemical Research* (from 1968), *Biochemistry*, *Chemical Reviews*, *Inorganic Chemistry*, *Journal of Agricultural & Food Chemistry*, *Journal of the American Chemical Society*, *Journal of Chemical Information & Computer Sciences*, *Journal of Chemical & Engineering Data*, *Journal of Medicinal Chemistry*, *Macromolecules* (from 1968), *The Journal of Organic Chemistry*, *The Journal of Physical Chemistry*. e Includes estimate of pages in indexes of Vol. 91, to be published in 1980. f National meeting registrations exclude half- and one-day tickets through 1975; include one-day tickets beginning in 1976. g Two spring meetings. h Excludes Middle Atlantic symposium with 900 registrants.